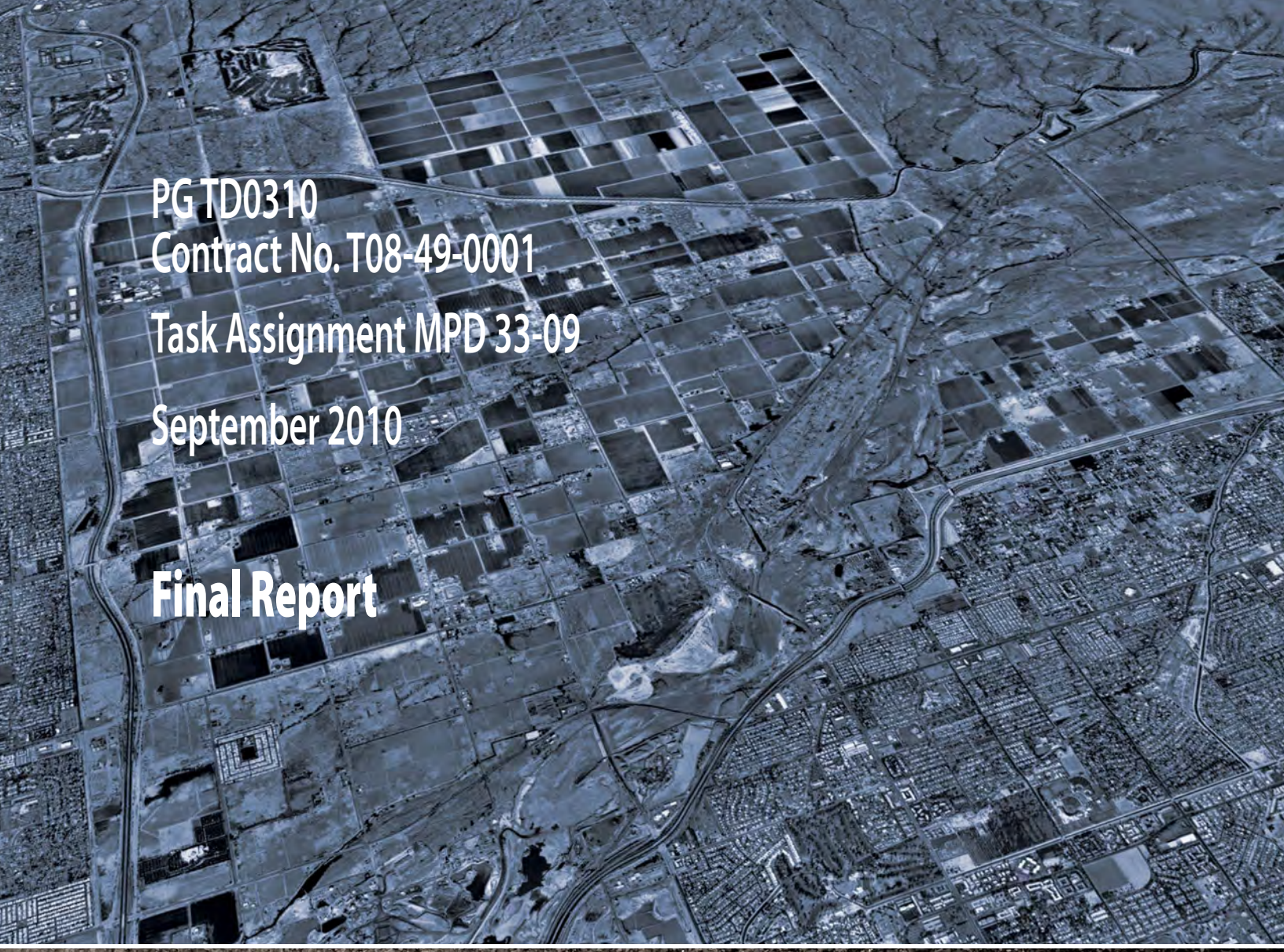

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September 2010

Final Report

2010 Salt River Pima-Maricopa Indian Community Long Range Transportation Plan

Prepared for:

Salt River Pima-Maricopa Indian Community

HDR

Salt River Pima-Maricopa Indian Community

2010 Long Range Transportation Plan

Final Report

Prepared by:

HDR Engineering, Inc.

September 2010

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Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
ADT	Average Daily Traffic
ALCP	*Arterial Life Cycle Program*
APTNA	Arkansas Public Transportation Needs Assessment
ARRA	American Reinvestment and Recovery Act
ASU	Arizona State University
BIA	Bureau of Indian Affairs
CAP	Central Arizona Project
CMAQ	Congestion Management and Air Quality
DCR	Design Concept Report
FLH	Federal Lands Highway
FHWA	Federal Highway Administration
HCM	*Highway Capacity Manual*
HDR	HDR Engineering, Inc.
HOV	High Occupancy Vehicle
IRR	Indian Reservation Roads Program
IRR TIP	Indian Reservation Roads Transportation Improvement Program
ITE	Institute of Transportation Engineers
LOS	Level of Service
LRTP	Long Range Transportation Plan
MAG	Maricopa Association of Governments
MCDOT	Maricopa County Department of Transportation
NHTSA	National Highway Transportation Safety Administration
PARA	Planning Assistance for Rural Arizona
PIFFA	Planning, Impact Fees, and Fiscal Analysis
RME	Red Mountain Engineering, LLC
RNDF	Relative Need Distribution Factor
RPM	Recessed Pavement Marker
RTP	Regional Transportation Plan
SRPMIC	Salt River Pima Maricopa Indian Community
SRPMIC PD	Salt River Pima Maricopa Indian Community Police Department

Acronyms and Abbreviations

SRTS	Salt River Transit System
STDM	City of Scottsdale Travel Demand Model
TAC	Technical Advisory Committee
TAZ	Traffic Analysis Zone
TIP	Transportation Improvement Program
TRB	Transportation Research Board
TTIP	Tribal Transportation Improvement Program
VMT	Vehicle Miles of Travel

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1.0 Introduction

The preparation of the Salt River Pima-Maricopa Indian Community (SRPMIC, Community) 2010 Long Range Transportation Plan (LRTP) was funded by the Arizona Department of Transportation (ADOT) Multimodal Planning Division's (MPD) Planning Assistance for Rural Areas (PARA) program. The PARA program is funded through the Federal Highway Administration's (FHWA) State Planning and Research program to non-metropolitan communities for the purpose of conducting transportation planning studies. PARA funds may be applied to address a broad range of planning issues related to road and non-motorized transportation modes.

1.1 Study Area Characteristics

The Salt River Pima-Maricopa Indian Community is a sovereign tribe located on the east side of the Phoenix metropolitan area. It is bordered by the cities of Mesa and Tempe to the south, Scottsdale to the west and north, the town of Fountain Hills and the Fort McDowell Indian Reservation to the north, and unincorporated Maricopa County and Tonto National Forest to the east. The Community is a member of the Maricopa Association of Governments (MAG), the municipal and intergovernmental planning organization for Maricopa County and the metropolitan Phoenix area.

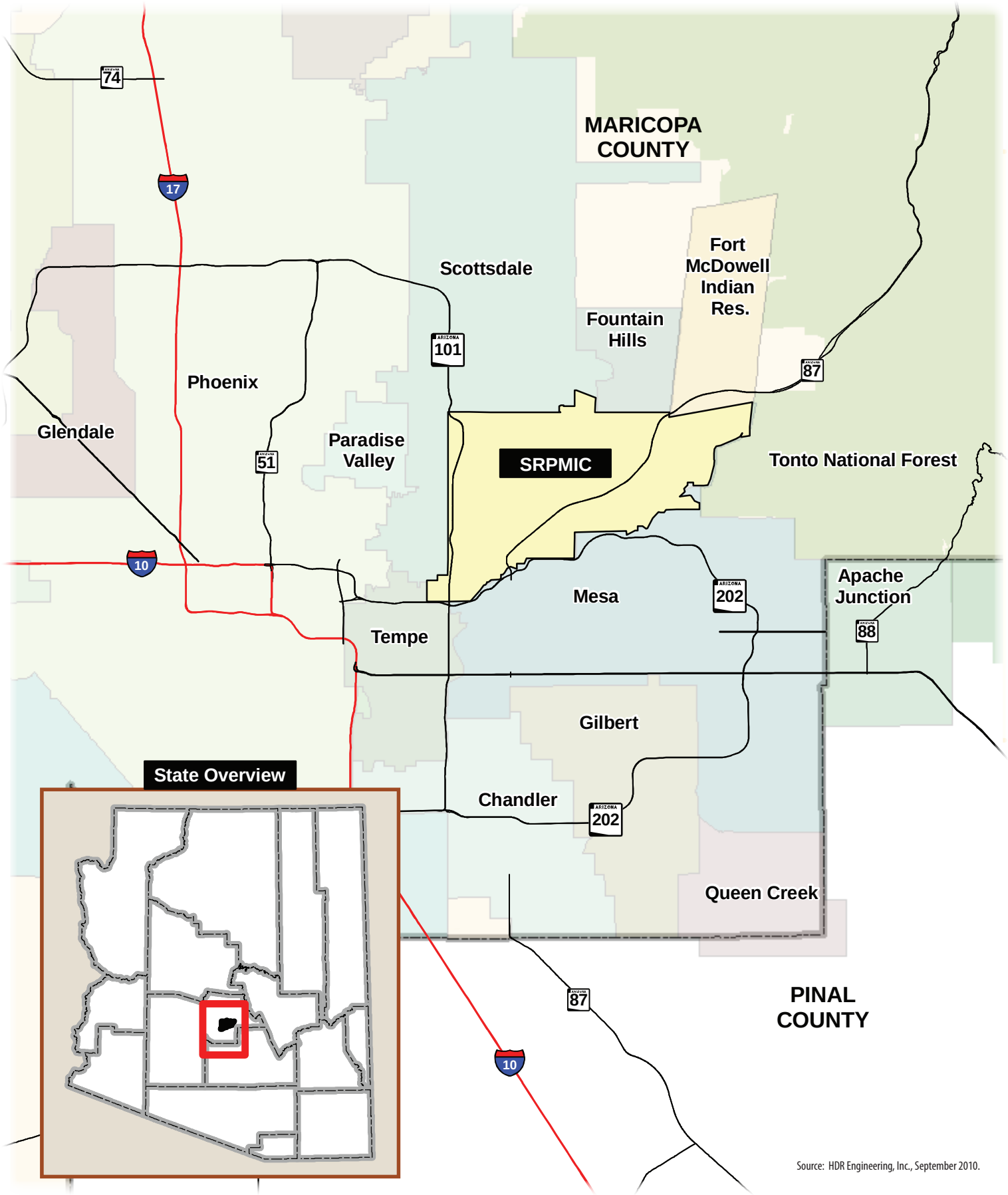
The study area for this LRTP is the SRPMIC itself. While Mesa, Tempe, Scottsdale, Fountain Hills, and Maricopa County were stakeholders in this planning study, the study area did not include land owned by any of these jurisdictions. Figure 1 shows SRPMIC in its regional context. Figure 2 shows the SRPMIC Long Range Transportation Planning Study Area.

The Community is comprised of two Native American tribes with two distinct backgrounds and cultures: the Pima, "Akimel O'Odham" (River People) and the Maricopa, "Xalychidom Piipaash" (people who live toward the water). Although these tribes are distinct, the Community is considered in its entirety for this long range transportation planning study.

SRPMIC encompasses approximately 85 square miles (54,632 acres), with 19,000 held as a natural open space preserve located primarily in the eastern portion of the Community. Elevations are higher in the open space preserve and the topography of the Sonoran Desert landscape is anchored by Red Mountain and Saddleback Mountain. The Verde River meets the Salt River east of Red Mountain. Many sensitive cultural sites are located across this open space preserve. The Central Arizona Project Canal traverses this preserve area. The Beeline Highway (SR 87) cuts through this area providing a connection between Mesa and Payson.

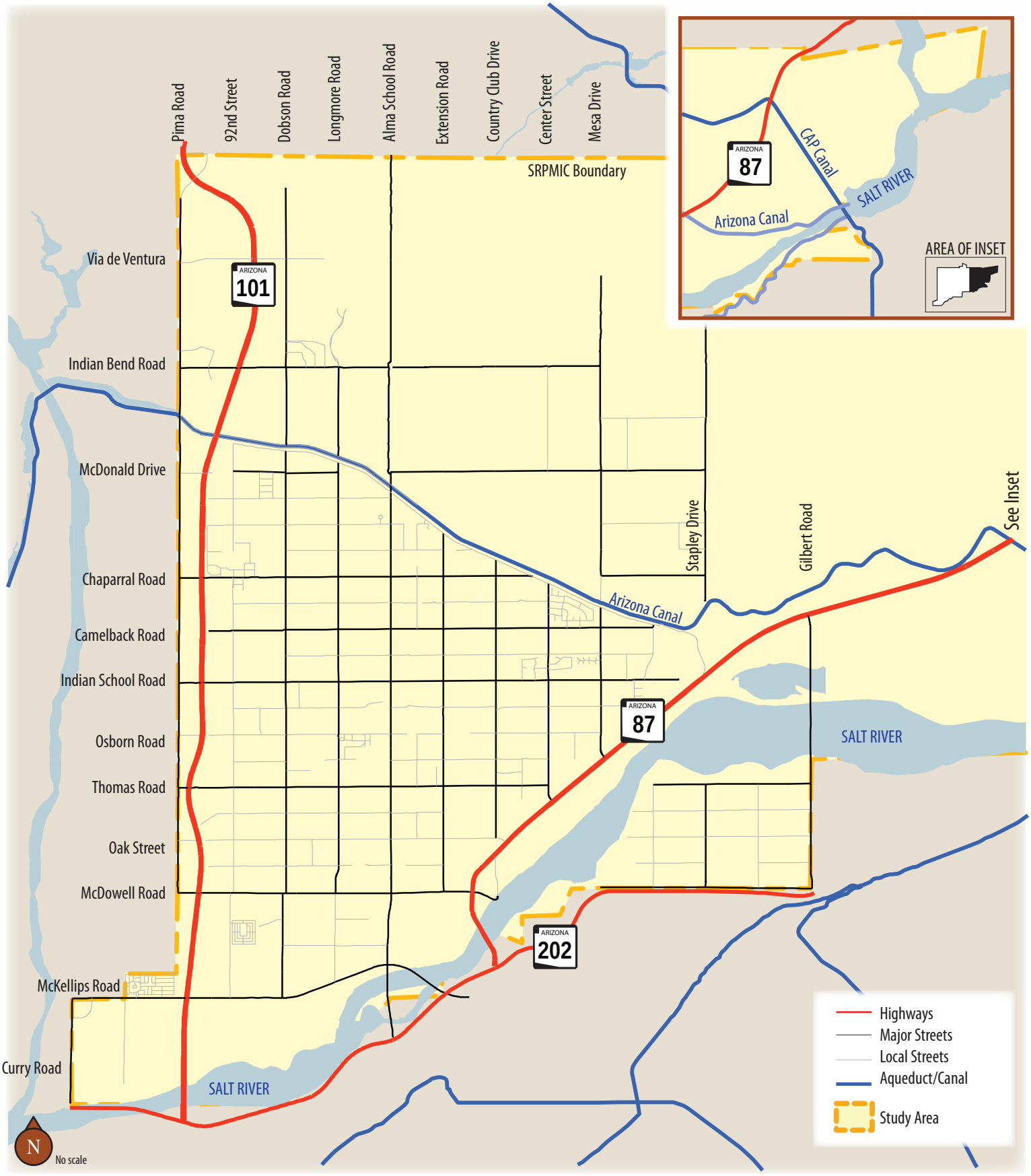
The Salt River runs along the southern edge of the Community, separating the Lehi area from the rest of the Community. Sand and gravel mining operations are located along the lower portions of the Salt River. The upper Salt River also serves as a barrier between the Community and the Tonto National Forest.

Moving westward across the Community, the landscape transitions from open space preserve to agriculture. There are approximately 17,000 acres under cultivation in a variety of crops including cotton, melons, potatoes, onions, broccoli and carrots. Scattered residences are located in the agricultural area, primarily along the road grid. Irrigation water is pumped from



Source: HDR Engineering, Inc., September 2010.

FIGURE 1 | SRPMIC Vicinity Map



Sources: ADOT, SRPMIC, Census, HDR Engineering, Inc., September 2010.

FIGURE 2 | Study Area

groundwater wells or supplied by the Arizona Canal. The People's Village with schools and housing is located at the center of the Community.

The western portion of the Community is the interface between the rural Community and the urban centers of Scottsdale, Tempe, and Mesa. The Pima Freeway (L101) runs north-south along the western edge. Two Community casinos are located in this area – one at Indian Bend Road, the other at McKellips Road. The Pima Road corridor is the Community's commercial and industrial development area. The Community is building a Major League Baseball spring training facility on Pima Road between Indian Bend Road and Via de Ventura.

1.2 Indian Reservation Roads Program

This LRTP meets an Indian Reservation Roads (IRR) Program requirement. The IRR Program addresses transportation needs of tribes by providing funds for planning, design, construction, and maintenance activities. The program is jointly administered by the FHWA's Federals Lands Highway (FLH) Office and the Bureau of Indian Affairs (BIA) in accordance with an interagency agreement. It provides guidance to tribes and tribal organizations for planning, designing, constructing and maintaining transportation facilities. It also establishes a funding distribution methodology to allocate funds based on the relative needs of tribal communities for transportation assistance. The BIA established final rules for the Indian Reservation Roads Program in the Federal Register Volume 69, No. 137, Monday July 19, 2004.

The Indian Reservation Roads are public roads that provide access to and within Indian reservations, Indian trust land, restricted Indian land, and Alaska native villages. IRR funds can be used for any type of federal Title 23[1] transportation project providing access to or within Federal or Indian lands and may be used for the state/local matching share for apportioned Federal-aid Highway Funds. SRPMIC is a self-governance tribe under the Indian Self-Determination Act (Public Law 93-638) and manages Indian Reservation Road funding to maintain its current road system and construct new facilities.

IRR Requirements

The IRR Inventory is a basic requirement for the funding allocation system. SRPMIC maintains a comprehensive database of all transportation facilities eligible for IRR funding. The inventory is approved by both the BIA and the tribe. The BIA uses this roadway characteristics data to generate the construction cost estimates and vehicle miles of travel (VMT) components of the Relative Need Distribution Factor (RNDF) for distributing IRR funds. Within SRPMIC, there are 178 miles of Indian Reservation Roads. More than 137 miles are under BIA and Community jurisdiction. The City of Scottsdale maintains pavement, drainage and traffic signals on seven miles of Pima Road. The Maricopa County Department of Transportation (MCDOT) has jurisdiction of 11 miles, and ADOT has jurisdiction of 23 miles of road. The IRR roadway characteristics database includes classification, route number, bridge number, current traffic volumes, maintenance responsibility, and ownership. Appendix A shows the SRPMIC IRR System Inventory.

In addition to a transportation facility inventory, the IRR Program also requires a LRTP. The purpose of the LRTP is to demonstrate a tribe's transportation needs and develop strategies to meet these needs. The previous SRPMIC LRTP was completed in April 2001.

A third IRR Program requirement is the Tribal Transportation Improvement Program (TTIP). This document is consistent with the LRTP and contains all funded projects programmed for construction in the next three to five years. Typically, BIA selects projects from the TTIP based on funding availability on

[1] *Title 23 of the United States Code outlines the role of highways in the United States Code.*

a state-by-state basis to develop an IRRTIP for approval by the Secretary of Interior and the Secretary of Transportation.

1.3 Community Outreach

Two rounds of Community outreach were conducted for this long range transportation planning effort. The first round focused on issue identification and data collection. The study team conducted interviews with 18 stakeholders, attended Elders' Breakfasts and conducted two Community Workshops. The team also met with the Young River People's Council, attended district meetings and attended the Salt River Safety Day.

The second round of Community outreach was intended to provide Community members with an overview of the LRTP recommendations and understand any other issues or concerns to be addressed in the study recommendations. The study team attended Elders' Breakfasts, attended the SRPMIC Earth Day Celebration, conducted two Community Workshops and made two presentations to the SRPMIC Tribal Council.

In addition, the study team held meetings at key project milestones with a Technical Advisory Committee (TAC) that included representatives from ADOT, MCDOT, MAG, City of Scottsdale and SRPMIC.

Appendix B includes meeting notes and summary reports from the outreach process.

1.4 Key Issues

Key issues identified through the Community outreach process include regional population and employment growth, cut-through traffic, traffic safety, Salt River bridge crossings, public transit and bicycle and walking routes.

Growth

Population growth within SRPMIC has been relatively slow compared to the increases seen elsewhere in Maricopa County. Census 2000 showed a SRPMIC population of 6,405 living in 11,959 households. Maricopa Association of Governments (MAG) estimated a July 1, 2008, population of 6,829 living in 2,083 households. This amounts to a 0.8 percent annual growth rate for the eight-year period. Comparatively, total population in Maricopa County grew at an estimated 33.2 percent annual rate for the same eight years increasing from 3.07 million persons in 2000 to 3.95 million persons in 2008.

The SRPMIC Enrollment Office set the Community membership as 8,976 as of June 30, 2009. The Community's statistics indicate that half of the tribe's population is under age 21. Based upon 2000 Census data, it is critical to note that Community members are much less likely to move or change residences compared to non-members. Over the last decade, more than two-thirds of families reside in the same home. A portion of the SRPMIC membership lives outside of the Community itself.

The more significant story within SRPMIC has been employment growth. The Community has developed two casinos – one on McKellips Road, the other on Indian Bend Road. The Pima Freeway corridor is designated for commercial mixed-use and has attracted significant retail and office development. In 2008, SRPMIC identified over 6.8 million square feet of non-residential building space either existing, permitted, or under construction within the Community. In early 2011, SRPMIC will open a new spring training facility located on Pima Road between Indian Bend and Via de Ventura to host the Arizona Diamondbacks and the Colorado Rockies.

SRPMIC members accustomed to the traditional tranquil way of life are concerned about the impacts on Community roads from the added traffic from both regional population growth and increased commercial activity on the Pima Road corridor.

Cut-Through Traffic

Cut-through traffic is the top concern for Community members. The issue was raised at the first TAC meeting, the Elders Breakfast, and at other stakeholder and special interest group meetings. Concurrent with this long range transportation planning study effort, the Tribal Council authorized a study by Red Mountain Engineering to identify short term solutions to the cut-through traffic problem.

Increased traffic on Community roads has been driven by several factors. Overall regional population growth has meant more vehicles on all roads. The growing congestion on the regional freeway system such as the Red Mountain Freeway (L202) and Pima Freeway causes drivers to look for shortcuts across the Community. The casinos and Pima Road commercial development are also attracting more trips to the Community. When Pima Freeway is closed by a severe traffic incident, the police department said that Pima Road is the primary traffic detour, which generates additional cut-through traffic across SRPMIC.

Traffic Safety

The SRPMIC Police Department said in a stakeholder interview that the highest crash locations are located on roads travelling between Pima Road and the Pima Freeway. Chaparral Road and McKellips Road have the highest number of crashes. Livestock-related crashes are prevalent along the State Route 87 (Beeline Highway). Also along the Beeline Highway, some fatal crashes have occurred with vehicles entering from side streets and being hit by high speed cross traffic.

Salt River Bridge Crossings

The Salt River separates Lehi from the larger Salt River Pima-Maricopa Indian Community lands. Currently, there are four crossings of the Salt River between Mesa and SRPMIC: Alma School Road, McKellips Road, Country Club Drive, and Gilbert Road. In 2008, floods washed away the riverbed crossing of the northbound lanes of Gilbert Road from Mesa to SRPMIC. The McKellips Road crossing is also a riverbed crossing.

In August 2009, MCDOT completed a Design Concept Report to identify preferred bridge locations and designs for crossings at Dobson Road, McKellips Road and Gilbert Road.

Public Transit

The Salt River Transit System (SRTS) provides dial-a-ride services for Community residents traveling within the Community, and into Mesa, Tempe, and Scottsdale for shopping, employment, medical and social services. Both Community members and the transit service operators expressed a need for additional service with better connectivity to the regional transit system for access to health care facilities, shopping, work and other activities.

Bicycle and Pedestrian Routes

There is an overall lack of sidewalks and pedestrian amenities throughout SRPMIC. There are no designated bicycle routes or multiuse paths. During recent outreach, some have said that sidewalks are not a high priority. However, the Elders and the Youth Council both indicated a need to have a safe place for kids so that they do not have to walk in the street. The Elders expressed an interest in multi-use paths for bicycle, pedestrian, or equestrian use. Stakeholders from outside the Community have urged a

regionally connected multi-use path system. However, the Elders were adamant against providing additional access for the outside public to trespass on the Community. They suggested that any paths should be internal to the Community and not provide connections to encourage use by those living outside of SRPMIC.

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2.0 Existing Transportation System Conditions

This section describes the SRPMIC existing multimodal transportation system. It provides details on road network, public transit system, and bicycle and pedestrian facility characteristics.

In April 2009, SRPMIC completed an inventory of all of the roads and bridges within the Community for the Indian Reservation Roads (IRR) program. This inventory provides detailed information on road characteristics, including number of travel lanes, BIA functional classification, average daily traffic, route ownership, and surface condition.

This section presents the road characteristics data collected by SRPMIC and augmented with data collected as part of this study. Information on the current public transit service and bicycle and pedestrian facilities from interviews conducted with SRPMIC officials is also included.

2.1 Previous Plans and Studies

This section identifies previous and current transportation studies reviewed for the preparation of this document.

ADOT Arizona Rural Transit Needs Study, 2008

The purpose of this study was to develop regionally based needs and solutions for rural transit service in Arizona. Transit demand in rural Arizona is projected to grow from 7.8 million passenger trips in 2007 to 10.5 million in 2016, an increase of 34 percent. Currently, only 18 percent of estimated demand for rural transit services is being met. Existing rural transit services are projected to meet only 13 percent of total ridership need in 2016 if no additional services are introduced. The study identified steps to address the transit needs of rural Arizona such as adding rural public transit service within cities, towns, and Tribal Reservations to assure service needs of the elderly, persons with disabilities, and the general public are met; connect rural and urban communities, which represents a growing Arizona need; increase funding at all levels of government to support these services, with cooperation from private and non-profit sectors; and, establish clearly defined roles and responsibilities between the state, councils of governments, local governments, Tribal Governments and transit operators.

MCDOT Salt River Bridge Crossing Study, 2009

MCDOT has prepared a Design Concept Report (DCR) dated August 2009 for three bridges to identify the preferred bridge locations and designs for bridges across the Salt River at Dobson Road, McKellips Road, and Gilbert Road. The report also scopes the widening of McKellips Road from the Pima Freeway to the Salt River. These projects are being developed by MCDOT in partnership with SRPMIC and the City of Mesa. The design effort will commence once a partnership agreement is completed on the $170+ million project.

Pima Road Design Concept Report, 2009

SRPMIC, the City of Scottsdale and ADOT completed a Design Concept Report for Pima Road between McDowell Road and 90th Street. This study established the cross-section and alignment of this key north-south arterial along the Community's commercial core. The study objectives included improving traffic operations to accommodate growth, improving business access, enhancing corridor character, accommodating multimodal access, and safeguarding adjacent neighborhoods and community resources. The recommended alternative includes four 11-foot travel lanes, two 5-foot bike lanes, and a 14-foot median. The Final DCR was published in October 2009.

Red Mountain Engineering Cut-Through Traffic Study

Red Mountain Engineering conducted a cut-through traffic study to identify potential solutions to reduce non-Community travel on SRPMIC roads between Scottsdale and Mesa. Recommendations from this study are incorporated into this Long Range Transportation Planning Study.

SRPMIC General Plan, 2006

The SRPMIC General Plan is the Community's blueprint for land use, development, conservation and preservation. It is the basis for decision making regarding long-term physical development and the protection of the Community's cultural and natural resources. The plan focuses on establishing a framework of sustainability to ensure that the current and future generations can sustain the social, economic and environmental health of the Community. It includes a land use element and a transportation/circulation element, which are key inputs into this current long range transportation planning effort.

SRPMIC Indian Reservation Roads System Inventory, 2009

The IRR System was last updated in 2009 and included an inventory of all of the roads and bridges within the Community for the IRR program. This inventory provides detailed information on road characteristics, including number of travel lanes, BIA functional classification, average daily traffic, route ownership, and surface condition. The planning effort identified near-term roadway improvement needs that were adopted by the SRPMIC Council as an amendment to the 2001 Transportation Plan.

SRPMIC Transportation Planning Study, 2001

The 2001 SRPMIC Transportation Planning Study indentified near-term and long-term transportation needs within SRPMIC. It provided an inventory of the transportation network, an evaluation of transportation needs, and documentation of a 20-year transportation plan that responds to both near- and long-term development scenarios. It also established priorities for implementation of the recommended improvements. This plan updates the 2001 Transportation Planning Study.

Salt River Transit Five Year Plan, 2009

The Salt River Transit Five Year plan is a five-year implementation plan that provides the SRTS with a framework for meeting transit service needs in SRPMIC. The plan included Community goals for transit, a transit demand estimate, and strategies for coordinating with other transit services. This plan is also used for evaluating the SRTS for future Section 5311 Rural Public Transportation Program funding.

Various Traffic Impact Studies

SRPMIC Community Development Department provided copies of traffic impact analysis reports prepared for developments on the Pima Road commercial corridor. These studies were reviewed for socioeconomic and traffic data and road improvement recommendations.

2.2 Road Characteristics and Conditions

This section presents the key physical and operating characteristics of major roads within SRPMIC. The key roads are described below:

North – South Routes

Pima Road

Pima Road runs north-south along the western boundary of the Community. The road serves as access to the Community's commercial corridor and the City of Scottsdale. A Final Design Concept Report shows the completed corridor widening to its ultimate four-lane cross-section with two travel lanes in each direction. The City of Scottsdale maintains pavement, drainage and traffic signals on Pima Road.

Pima Freeway (L101)

The Pima Freeway is an ADOT facility through SRPMIC east of Pima Road with three general purpose travel lanes and one High Occupancy Vehicle (HOV) travel lane in each direction. The freeway serves as a vital part of the regional freeway system. This route provides access to both SRPMIC and the City of Scottsdale at nine (9) traffic interchanges listed below from south to north:

- McKellips Road
- McDowell Road
- Thomas Road
- Indian School Road
- Chaparral Road
- McDonald Drive
- Indian Bend Road
- Via de Ventura
- Pima Road/90th Street

92nd Street

92nd Street runs across the west side of the Community, just east of the Pima Freeway. In addition to serving housing, the southern portion of the road provides access to the Casino Arizona and the Roadrunner Trailer Park, while the northern portion serves the Scottsdale Community College. The road has one travel lane in each direction. It is maintained by SRPMIC.

Dobson Road

Dobson Road runs across the west side of the Community. The southern portion of this route mainly serves housing and farming operations, while the northern portion serves Casino Arizona at Indian Bend and some commercial properties. It is maintained by SRPMIC and has one travel lane in each direction.

Longmore Road

Longmore Road runs across the west side of the Community between Dobson Road and Alma School Road. The route serves residential housing, farming operations, Talking Stick Golf Club, Vulcan Materials Gravel Pit, two churches, the Salt River Community Center, the Salt River Elementary School, the Salt River Ball Fields, and the west entrances of the Government Tribal Complex. It is maintained by SRPMIC and has one travel lane in each direction.

Alma School Road

Alma School Road runs across the west side of the Community. The route mainly serves housing and farming operations and the east entrances of the Government Tribal Complex. It provides two key bridge crossings: 1) Salt River, and 2) Arizona Canal. It provides a direct connection to Mesa and the Red Mountain Freeway. It is maintained by both MCDOT and SRPMIC and has two travel lanes in each direction from the 202 to McDowell (MCDOT) and one travel lane from McDowell to McDonald (SRPMIC).

Country Club Drive

Country Club Drive serves residential housing, agriculture, the Agate Steel Company, and provides the Community a connection to the State Route 87 (Beeline Highway). It is maintained by SRPMIC and has one travel lane in each direction.

Mesa Drive

Mesa Drive serves residential housing, agricultural operations, provides access to State Route 87 (Beeline Highway), and is one of the routes that has a bridge over the Arizona Canal. It is maintained by SRPMIC and has one travel lane in each direction.

Gilbert Road

Gilbert Road provides a bridge crossing of the Salt River and connections to Mesa and the State Route 87 (Beeline Highway). It is the only direct connection between the Lehi area and the rest of the Community. It is maintained by MCDOT and has two travel lanes in each direction. Floods in January 2008 washed out the northbound riverbed crossing of Gilbert Road. The low flow crossing will be repaired by MCDOT in the coming months. In addition, MCDOT has completed 40 percent design plans for a replacement bridge crossing.

East – West Routes

State Route 87 (Beeline Highway)

State Route 87 (Beeline Highway) is an ADOT facility that runs across the Community, extending from the southern boundary near the Salt River to the northern boundary near Shea BoulevaRoad It is an important link in the state highway system connecting the Phoenix-Mesa metropolitan area with Payson and the White Mountains. The road serves as access to the City of Mesa, Fountain Hills and the Fort McDowell Indian Reservation, as well as some of the Community's commercial activities, such as the Salt River Landfill. It has two travel lanes in each direction.

McKellips Road

McKellips Road extends through the Community from Hayden Road at the City of Scottsdale limits to the Salt River west of the Red Mountain Freeway. ADOT maintains 0.2 miles of the road near the Pima Freeway interchange. MCDOT maintains the remainder of the road. It has two travel lanes in each direction. It serves as an important sub regional connection between Scottsdale, Mesa, and the Pima Freeway. It provides access to Casino Arizona and Community housing.

McDowell Road

McDowell Road extends through the Community from Pima Road to Country Club Drive west of the Salt River. The road provides Scottsdale and Mesa access to the Pima Freeway and the Beeline Highway. It has three travel lanes in each direction. West of the Salt River, both ADOT and MCDOT maintain separate portions of this segment. East of the Salt River in Lehi, SRPMIC maintains McDowell Road between Mesa Drive and Gilbert Road. This section has one general purpose travel lane in each direction.

Thomas Road

Thomas Road provides direct access for the Community to and from the City of Scottsdale and the Pima Freeway. It is also a main east-west roadway within the Lehi community. Between Pima Road and Pima Freeway traffic interchange, Thomas Road has two travel lanes in each direction. East of the Pima

Freeway, Thomas Road has one travel lane in each direction. ADOT and SRPMIC each maintain separate segments of this route.

Indian School Road

Indian School Road provides direct access for the Community to and from the City of Scottsdale and the Pima Freeway. Between Pima Road and the Pima Freeway traffic interchange, Indian School Road has two travel lanes in each direction. East of the Pima Freeway, Indian School Road has one travel lane in each direction. ADOT maintains the road at the Pima Freeway traffic interchange. East of the freeway the route is maintained by SRPMIC.

Chaparral Road

Chaparral Road provides direct access to and from the City of Scottsdale and the Pima Freeway. The road serves housing developments and provides access to the Scottsdale Community College, the City of Scottsdale, and the Pima Freeway. West of the Scottsdale Community College there are two travel lanes in each direction. East of the college, there two travel lanes in each direction. ADOT, MCDOT, and SRPMIC all maintain separate segments of the route.

McDonald Drive

McDonald Drive runs intermittently across the Community. The road mainly serves agricultural lands and residential, but also provides one of the routes that connects the City of Scottsdale and the Pima Freeway. At the Pima Freeway connection, McDonald Drive is maintained by ADOT with two travel lanes in each direction. The unpaved portion east of the Pima Freeway is one lane in each direction and is maintained by SRPMIC.

Indian Bend Road

Indian Bend Road is an east-west roadway that provides direct access to and from the City of Scottsdale and the Pima Freeway. The route serves as access to the Pavilions Shopping Center, the Casino Arizona at Indian Bend Road, Talking Stick Golf Course. ADOT and SRPMIC each maintain separate segments of the route which has two lanes in each direction.

Via de Ventura

Via de Ventura is an east-west roadway that runs along the northwest corner of the Community and provides access to and from the City of Scottsdale and the Pima Freeway. The route provides access to commercial locations on Via de Ventura and Dobson Road. It provides alternative access to the Casino Arizona, and the Talking Stick Golf Course. It will also provide access to the future Spring Training Facility. ADOT and SRPMIC each maintain separate segments of the route which has two lanes in each direction.

Road Lanes and Intersection Control

Figure 3 shows total travel lanes for SRPMIC roads. It also shows the location of the 26 signalized intersections within the Community.

2.3 Road Functional Classification

SRPMIC roads are classified under two separate functional classification systems: BIA[2], and FHWA[3]. Functional classification is the grouping of highways, roads, and streets into classes based on mobility

[2] *Bureau of Indian Affairs. (October 21, 2004). Coding Guide and Instructions for IRR Inventory. Retrieved September 25, 2009, from BIA Web site, http:// www.doi.gov/bia/indianresroads/irr_coding_guide.pdf*

and land access. In general, arterials provide greater mobility with less direct access to land, while local roads and collectors provide more access to land with less mobility. Functional classification also serves as a basis for establishing speed limits, parking restrictions, design standards and access controls. A principal arterial, for example, typically provides mobility for longer distance trips with higher speeds and less access to adjoining properties. Conversely, the function of a local street is to provide direct access to neighborhoods at lower speeds.

Figure 4 shows the existing BIA road functional classification for Community roads. Appendix C includes a description of BIA functional classification. Figure 4 also shows the Community roads with an FHWA functional classification, which makes them eligible for federal funding. Appendix C also includes a map showing the 2009 FHWA Phoenix-Mesa Urban Area Functionally Classified Roads. The FHWA functional classification definitions are described below:

Principal Arterial: This facility serves regional circulation needs. It moves traffic at moderate speeds while providing limited access to adjacent land. Access is controlled through raised medians and through spacing and location of driveways and intersections.

Minor Arterial: This facility is generally a four-lane and sometimes a two-lane road. Its purpose is to serve regional/sub-regional traffic circulation needs by moving traffic at moderate speeds while providing limited access to adjacent land.

Major Collector: This facility provides for shorter distance trips, generally less than three miles, and primarily serves to collect and distribute traffic between key traffic generators, local streets and arterial streets. This classification provides direct access to abutting land.

Urban Collector: Urban Collectors serve shorter distance trips than the Major Collector (generally less than one mile). They provide direct access to adjacent land and collect and distribute traffic between key traffic generators, local streets and arterial streets.

Local Street: Local Streets provide direct access to adjacent land and distribute traffic to collector facilities.

Urban and Rural Areas

FHWA designates roads as urban or rural depending on the type of area served. Urban and rural areas have different characteristics, such as density, types of land use, density of street and highway networks and the nature of travel patterns. Typically, an urban area has a population of 5,000 or more and is designated by the U.S. Census Bureau. Rural areas are the areas outside of the boundaries of urbanized areas.

[3] *Federal Highway Administration. (1989). FHWA Functional Classification Guidelines. Retrieved September 25, 2009, from FHWA Web site, http://www.fhwa.dot.gov/planning/fctoc.htm*

Sources: HDR Engineering, Inc., September 2010.

FIGURE 3 | Road Lanes and Signalized Intersections

Sources: SRPMIC Indian Reservation Roads Inventory, April 2009.

FIGURE 4 | BIA Road Functional Classification

2.4 Current Traffic Conditions

Level of service (LOS) is a quantitative measurement of operational characteristics of traffic and the perception of the traffic conditions by both motorists and passengers. There are six levels of service defined by the Transportation Research Boards' *Highway Capacity Manual 2000* (HCM), published by the Transportation Research Board (TRB). Each level of service is given a letter designation from A to F, with A representing the optimal or best condition and F the worst Roadway segment level of service is characterized by the HCM as follows:

LOS A: Best, free flow operations (on uninterrupted flow facilities) and very low delay (on interrupted flow facilities). Freedom to select desired speeds and to maneuver within traffic is extremely high.

LOS B: Flow is stable, but presence of other users is noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within traffic.

LOS C: Flow is stable, but the operation of users is becoming affected by the presence of other users. Maneuvering within traffic requires substantial vigilance on the part of the user.

LOS D: High density but stable flow. Speed and freedom to maneuver are severely restricted. The driver is experiencing a generally poor level of comfort and convenience.

LOS E: Flow is at or near capacity. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within traffic is extremely difficult. Comfort and convenience levels are extremely poor.

LOS F: Worse, facility has failed, or a breakdown has occurred.

LOS A, B, and C are generally considered to be satisfactory service levels, while the influence of congestion becomes more noticeable at LOS D. LOS E is undesirable and is considered by most agencies to be the limit of acceptable delay, and LOS F conditions are considered to be unacceptable to most drivers. Most jurisdictions strive to attain a LOS of at least D or better on all roads and signalized intersections in urban areas, and LOS C is targeted for rural conditions.

LOS Analysis Methodology

Two types of level of service analysis were used to evaluate current traffic operation conditions on SRPMIC. The first is a generalized segment level of service analysis. This approach utilizes a lookup table that provides level of service volume thresholds by functional classification and number of through travel lanes. This lookup table, *Summary of Generalized Annual Average Daily Volumes for the Phoenix Urban Area*, was prepared by MAG for transportation planning studies. The volume thresholds in this table, shown in Appendix D, are based on Phoenix daily traffic characteristics and the HCM.

Secondly, level of service analysis for signalized intersections was conducted for intersections in the Pima Road commercial corridor. A traffic microsimulation model was developed for weekday AM and PM peak hours for 32 intersections in the Pima Freeway corridor.

Segment LOS Analysis

The IRR System Inventory provides average daily traffic (ADT) for many of the Community roads. The IRR inventory used count data from 2006, 2007 and 2008. These daily traffic counts together with generalized segment level of service thresholds are shown in Figure 5.

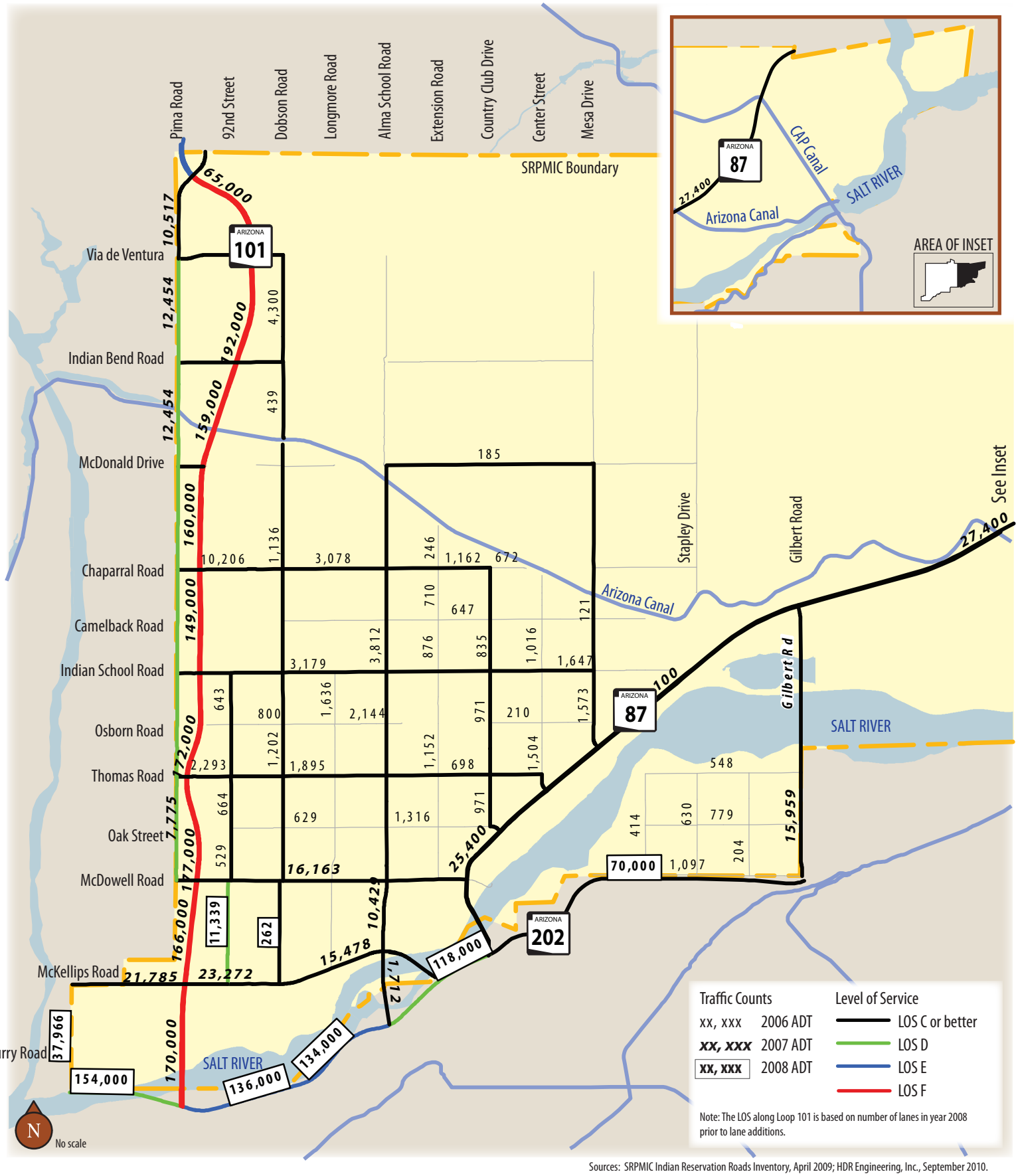
SYNCHRO Model

SYNCHRO is transportation operations analysis software prepared by Trafficware. It uses methods described in the HCM to evaluate traffic operations on road systems. It is widely used by traffic engineers for both signalized and non-signalized intersection operations analysis. Peak hour traffic volumes and peak hour factors, intersection lane configurations obtained during site visits, traffic control parameters, and free flow speeds were coded into the SYNCHRO models. A SYNCHRO model was developed for the Pima Road corridor to support the Pima Road Design Concept Report.

The HDR study team built on this existing effort and expanded it to include 35 intersections in the Pima Freeway Corridor. This includes all Pima Freeway signalized intersections within the Community. The model also includes intersections on Dobson Road and 92nd Street. The purpose of this Pima Freeway corridor SYNCHRO model is to provide intersection-level traffic operations analysis for both existing and future conditions. This analysis will provide information about the need for installing new traffic signals and the intersection lane configuration needed to accommodate future travel demand.

The City of Scottsdale and ADOT provided 2009 signal timing data for the signalized intersections. The study team reviewed a number of studies, including several traffic impact analysis reports and the July 2009 Pima Road traffic analysis report for the DCR, to identify recent traffic counts to support model development. Intersection turning movement counts were conducted in September 2009 for Pima Freeway corridor intersections at locations where no recent traffic data could be identified.

The location of the 35 study intersections in the Pima Freeway corridor is shown in Figure 6. Appendix E shows the study intersections' 2009 lane configuration and traffic control and the 2009 AM and PM peak hour traffic volumes and level of service.



Sources: SRPMIC Indian Reservation Roads Inventory, April 2009; HDR Engineering, Inc., September 2010.

FIGURE 5 | Current Traffic Conditions

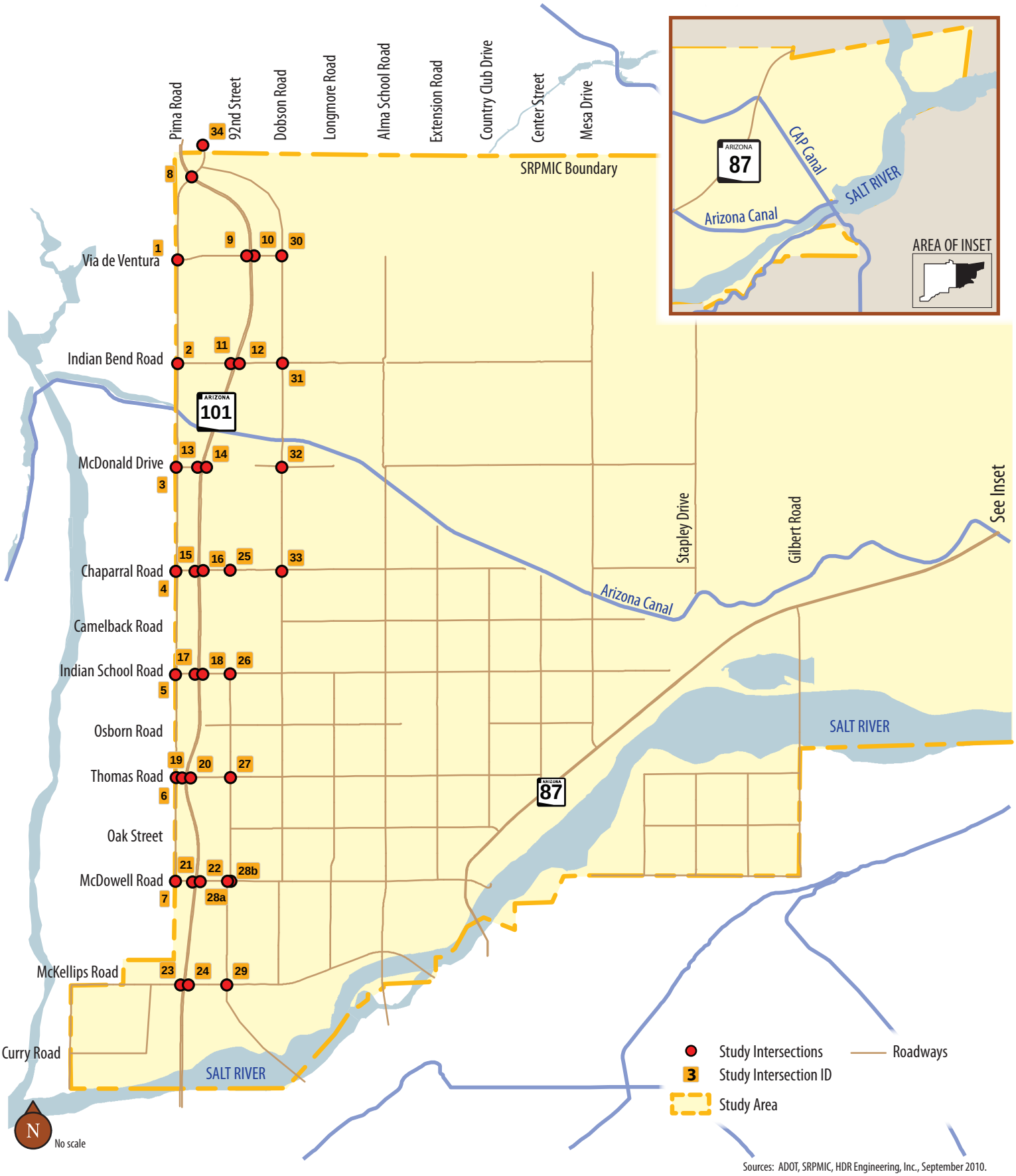


FIGURE 6 | Pima Freeway Corridor Study Intersections

2.5 Pavement Conditions

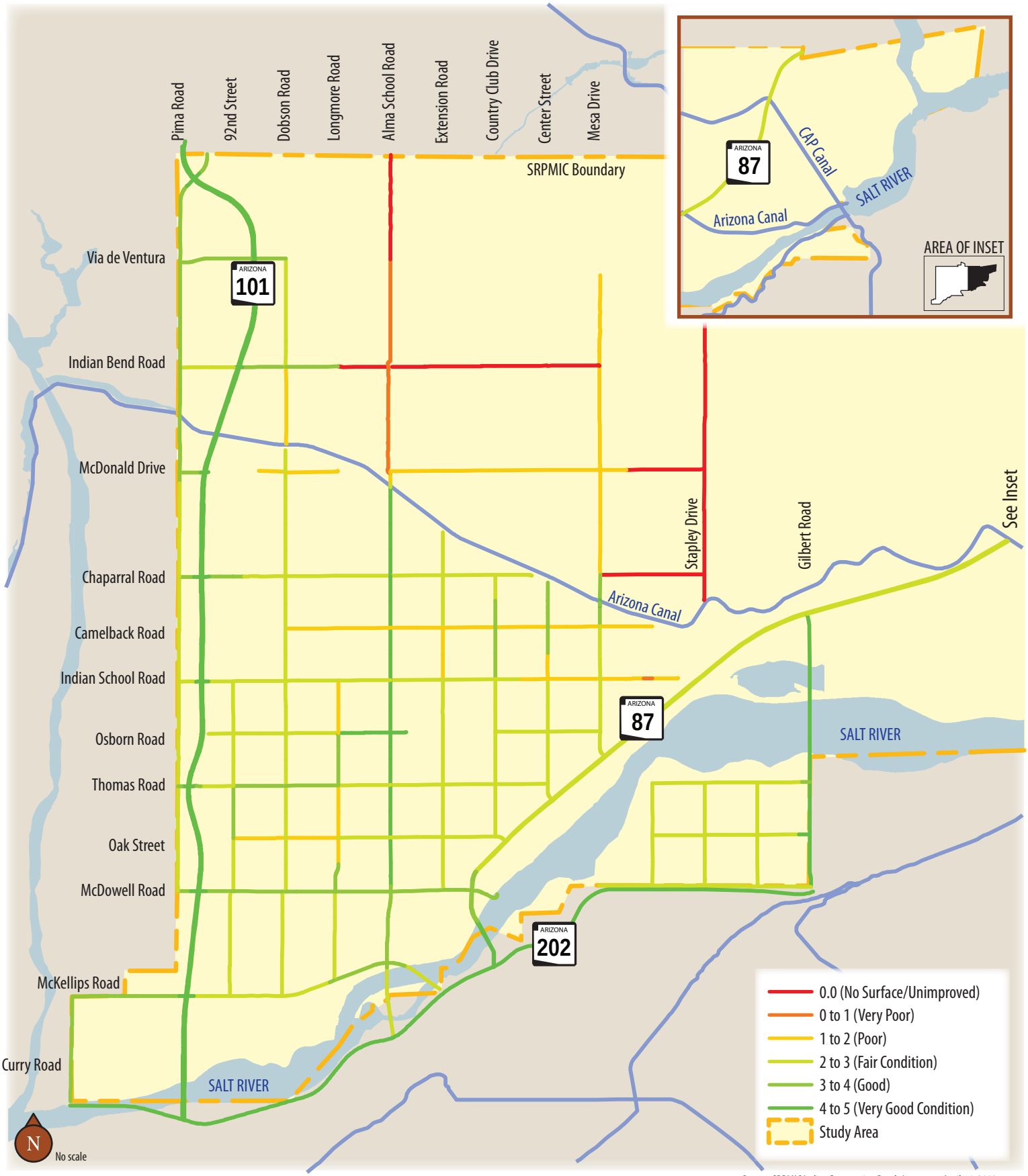
As part of its system inventory for the Indian Reservation Roads program, SRPMIC performed a visual inspection of all Community roads in 2008. Road surface conditions were assigned a value from 0 to 5:

- 0.0 – No Surface/Unimproved (Unpaved)
- 0.1 to 0.9 – Very Poor
- 1.0 to 1.9 – Poor
- 2.0 to 2.9 – Fair
- 3.0 to 3.9 – Good
- 4.0 to 5.0 – Very Good

Figure 7 shows the wearing surface condition for SRPMIC roads from the IRR System Inventory.

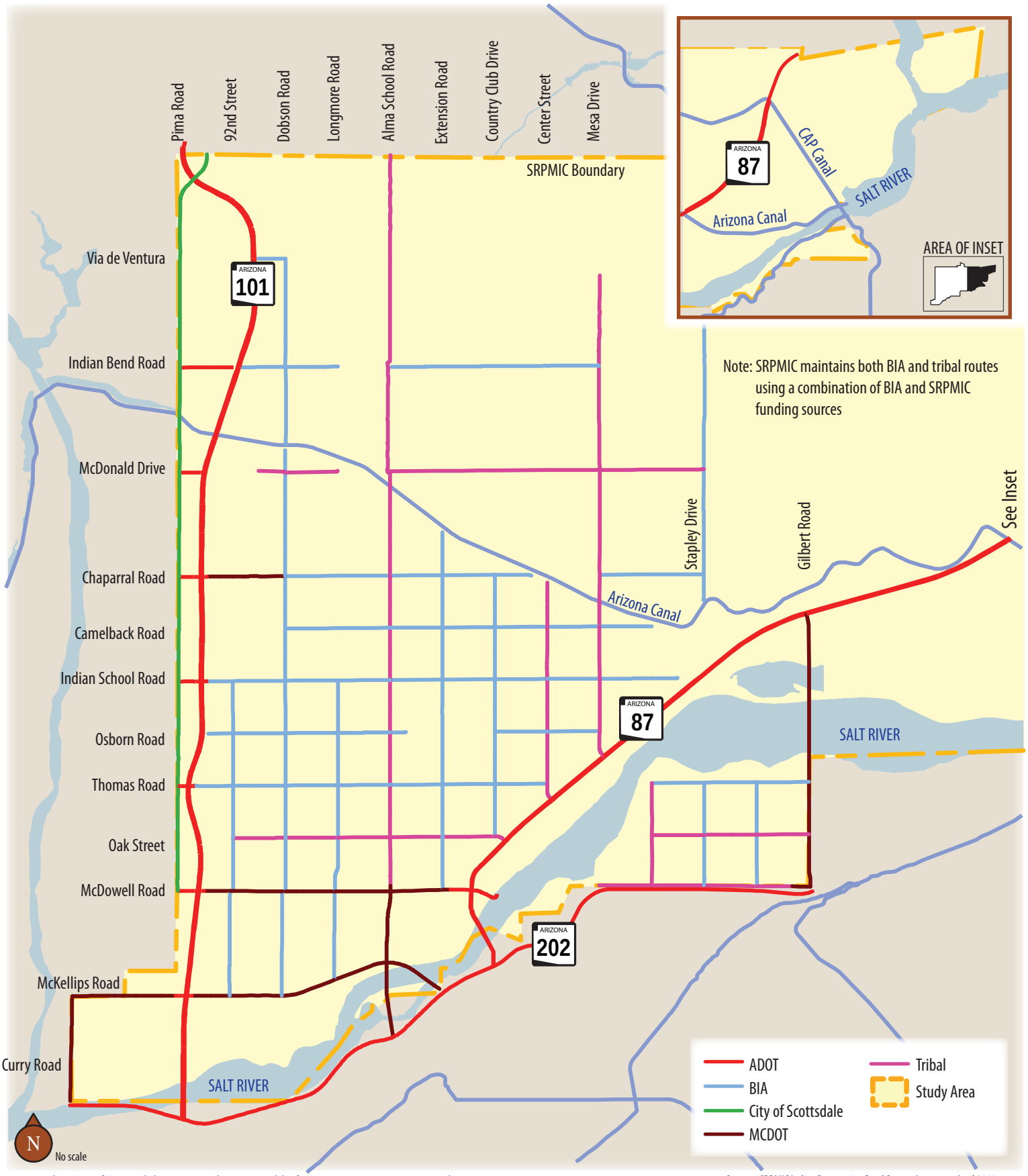
2.6 Maintenance Responsibility

Figure 8 shows the maintenance responsibility for SRPMIC roads. The BIA, SRPMIC, ADOT, MCDOT, and the City of Scottsdale all have some maintenance responsibility for roads on the Community.



Source: SRPMIC Indian Reservation Roads Inventory, April 16, 2009.

FIGURE 7 | Wearing Surface Rating



Note: The City of Scottsdale is currently responsible for maintaining pavement, drainage and traffic signals on Pima Road. A new agreement between SRPMIC and the City of Scottsdale will be negotiated once the corridor widening project is complete.

Sources: SRPMIC Indian Reservation Road System Inventory, April 2009.

FIGURE 8 | Maintenance Responsibility

2.7 Crash Data Analysis

A crash analysis was conducted for this study to identify crash patterns, trends and classifications during the five year period from June 1, 2003 to May 31, 2008 using crash data provided by ADOT. The data provided by ADOT includes incident date and time, crash location, crash severity, crash type, collision manner, environmental conditions, and crash causes.

Additional analysis was conducted on the crash information obtained from SRPMIC Police Department (SRPMIC PD) for the period from January 1, 2005 through July 16, 2009. The data provided by SRPMIC PD contained information about crash location, crash severity, and time and date.

The analysis was done to identify potential safety hazards contributing to motor vehicle crashes within the Community and suggest measures to improve safety for motor vehicles and pedestrians. As part of the analysis, a meeting with personnel from SRPMIC PD and a field review was conducted on July 20, 2009.

There were 858 crashes reported in the ADOT database and 3,694 crashes in the data provided by SRPMIC PD. It was found that 484 of the crashes reported in SRPMIC PD database were also reported in the ADOT database. The crash analysis presented in the following sections thus analyzed 858 crashes in the ADOT database and 3,210 additional crashes in the SRPMIC PD database.

ADOT Data

A total of 858 crashes were reported by ADOT within the study area during the five year analysis period. The ADOT data for 2004 and 2005 appears to be incomplete. These years show less than half of the crashes reported in 2003 and 2006. During the study period, 60 percent of the reported crashes occurred at the intersections, while 37 percent occurred at mid-block locations and driveway access points. Table 1 shows the crashes by location and percentage. Crashes occurring within 250-feet radius of an intersection were treated as intersection crashes. Crashes at mid-block locations occurred along roadway sections, at driveway access and alleys.

Table 1 Crash Locations (ADOT Data)

Location	Number of Crashes							% of Crashes
	2003*	2004**	2005**	2006	2007	1st Half 2008***	5-Yr Total	
Mid-Block	88	17	20	73	80	42	320	37%
Intersection	95	36	58	134	129	59	511	60%
Unknown	14	--	--	3	5	5	27	3%
Total	**197**	**53**	**78**	**210**	**214**	**106**	**858**	**100%**

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

Notes: * represent crashes from January 6, 2003 to December 31, 2003; ** data appears incomplete; *** represent crashes from January 1, 2008 to May 31, 2008.

SRPMIC PD Crash Data

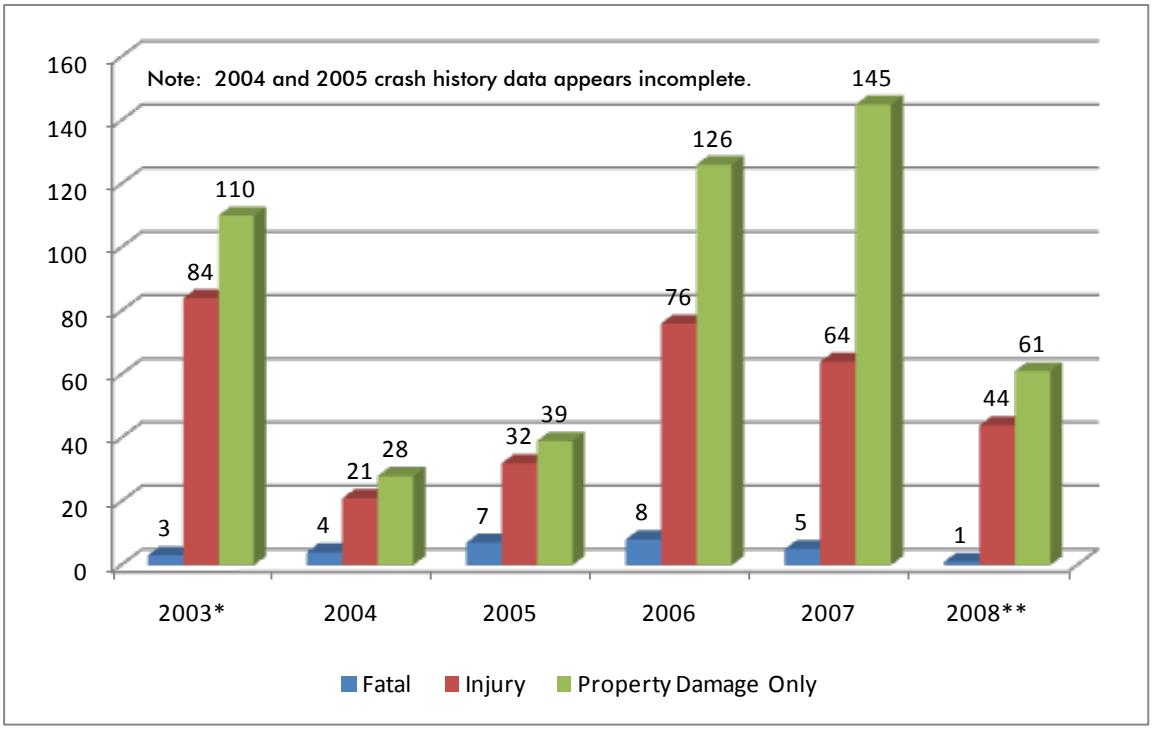
The 3,210 additional crashes reported in the study region by SRPMIC PD did not have information on whether the crashes were intersection related or not. However, the location references in the database indicate that there were a total of 2,596 (80 percent) crashes that occurred at intersections, 571 (18 percent) crashes occurred along mid-block and 43 (2 percent) crashes at unknown locations during the period from January 1, 2005 to July 16, 2009.

Crash Trends and Crash Severity

ADOT Crash Data

Figure 9 presents the yearly crash trend for years 2003 through 2008. The data showing that crashes reduced significantly in the years 2004 and 2005 appears incomplete. The highest number of fatalities occurred in year 2006.

Figure 9 Crash Trend from June 1, 2003 through May 31, 2008 (ADOT Data)



Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

Notes: * represent crashes from June 1, 2003 to December 31, 2003; ** represent crashes from January 1, 2008 to May 31, 2008.

Table 2 shows the total crashes by crash severity during the analysis period from June 1, 2003 to May 31, 2008.

Table 2 Crashes by Severity (ADOT Data)

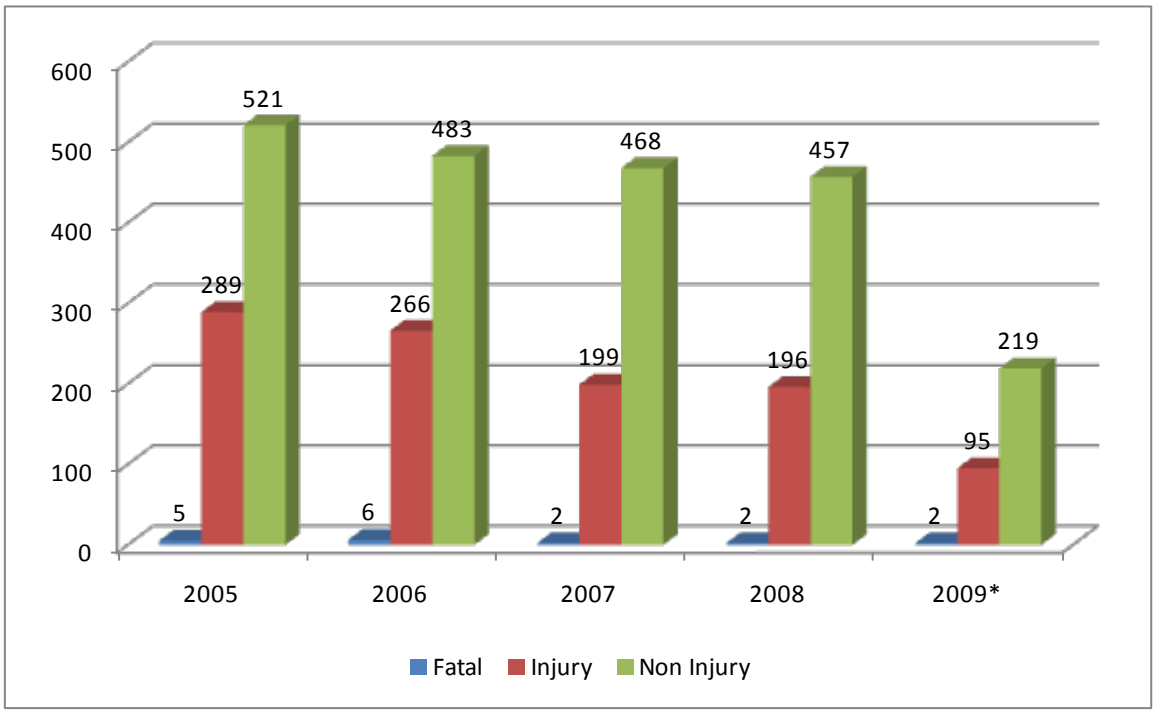
Severity	Number of Crashes	% of Total Crashes
Fatal	28	3.3%
Injury	321	37.4%
Property Damage Only	509	59.3%
Total	**858**	**100.0%**

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

SRPMIC Crash Data

Figure 10 presents the yearly crash trend for years 2005 through 2009 provided in the SRPMIC PD database. The chart shows a decline in total number of crashes at all levels of crash severity. The highest number of fatal crashes (6 crashes) occurred in 2006.

Figure 10 Crash Trend from January 1, 2005 through July 16, 2009 (SRPMIC PD Data)



Source: SRPMIC Police Department (July 2009).

Note: * represent crashes from January1, 2009 to July 16, 2009.

Table 3 presents the total crashes by crash severity during the analysis period from January 1, 2005 to July 16, 2009.

Table 3 Crashes by Severity (SRPMIC Data)

Severity	Number of Crashes	% of Total Crashes
Fatal	17	<1%
Injury	1,045	33%
Property Damage Only	2,148	67%
Total	**3,210**	**100.0%**

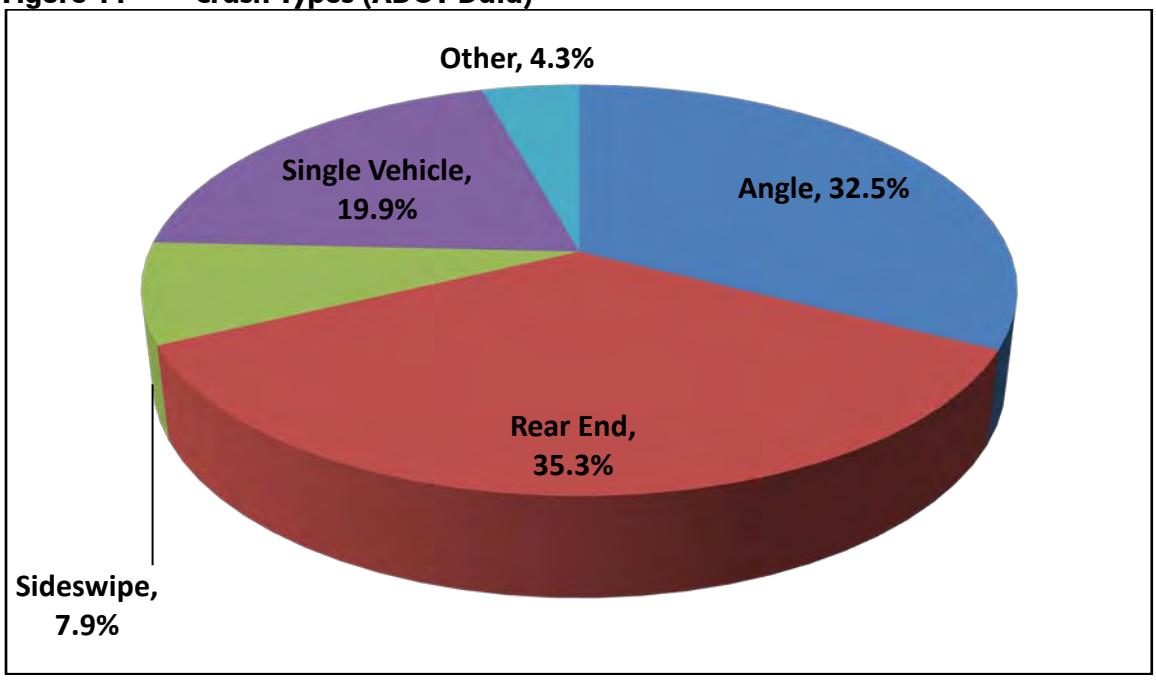
Source: SRPMIC Police Department, data from January 1, 2005 through July 16, 2009 (July 2009).

Crash Type

ADOT Crash Data

Figure 11 below shows the various crash types from the ADOT database that occurred during the analysis period. Rear end and angle crashes were the predominant crash types that occurred in the study area with 303 (35 percent) and 279 (32 percent) crashes respectively. Single vehicle crashes accounted for 20 percent (171) of the total crashes followed by sideswipe (68 or 8 percent) and other crash types (37 or 4 percent).

Figure 11 Crash Types (ADOT Data)



Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

SRPMIC PD Crash Data

The data provided by SRPMIC PD did not have information about crash type.

Harmful Collision Event

ADOT Crash Data

The majority of the crashes were due to a collision with other motor vehicles (79 percent). Other collision types included fixed object (11 percent), non-collision (4 percent), collision with bike or pedestrian (2 percent), non-fixed object (1 percent), collision with parked motor vehicle (<1 percent) and unknown collision type (1 percent). Table 4 identifies the number of crashes by the objects that were first collided with.

Table 4 Crashes by Objects First Collided With (ADOT Data)

Harmful Event	Number of Crashes	% of Total Crashes
Collision with Other Motor Vehicle	678	79.0%
Collision with Fixed Object	98	11.4%
Collision with Non Fixed Object	4	0.5%
Collision with Bike/Pedestrian	16	1.9%
Collision with Animal	13	1.5%
Collision with Parked Motor Vehicle	3	0.3%
All Non-Collision	35	4.1%
Unknown	11	1.3%
Total	**858**	**100.0%**

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

SRPMIC PD Crash Data

The data provided by SRPMIC PD did not have information about harmful collision event.

Environmental Conditions

ADOT Crash Data

Table 5 shows the light conditions existing when the crashes occurred. As shown in the table, the majority of the crashes occurred under daylight conditions (63 percent) followed by the number of crashes that occurred during dark or unknown lighting conditions (31 percent). Six percent of crashes occurred during dawn and the lighting condition of one crash was not reported.

Table 5 Crashes by Lighting Conditions (ADOT Data)

Light Conditions	Number of Crashes	% of Total Crashes
Daylight	538	63%
Dark/Unknown Lighting	264	31%
Dawn	55	6%
Not Reported	1	<1%
Total	**858**	**100.0%**

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

Statistics for the crash data indicated that 723 (84 percent) crashes occurred under clear weather conditions, whereas 80 (9 percent), 25 (2 percent) and 30 (3 percent) crashes occurred during cloudy, rainy and other weather conditions, respectively.

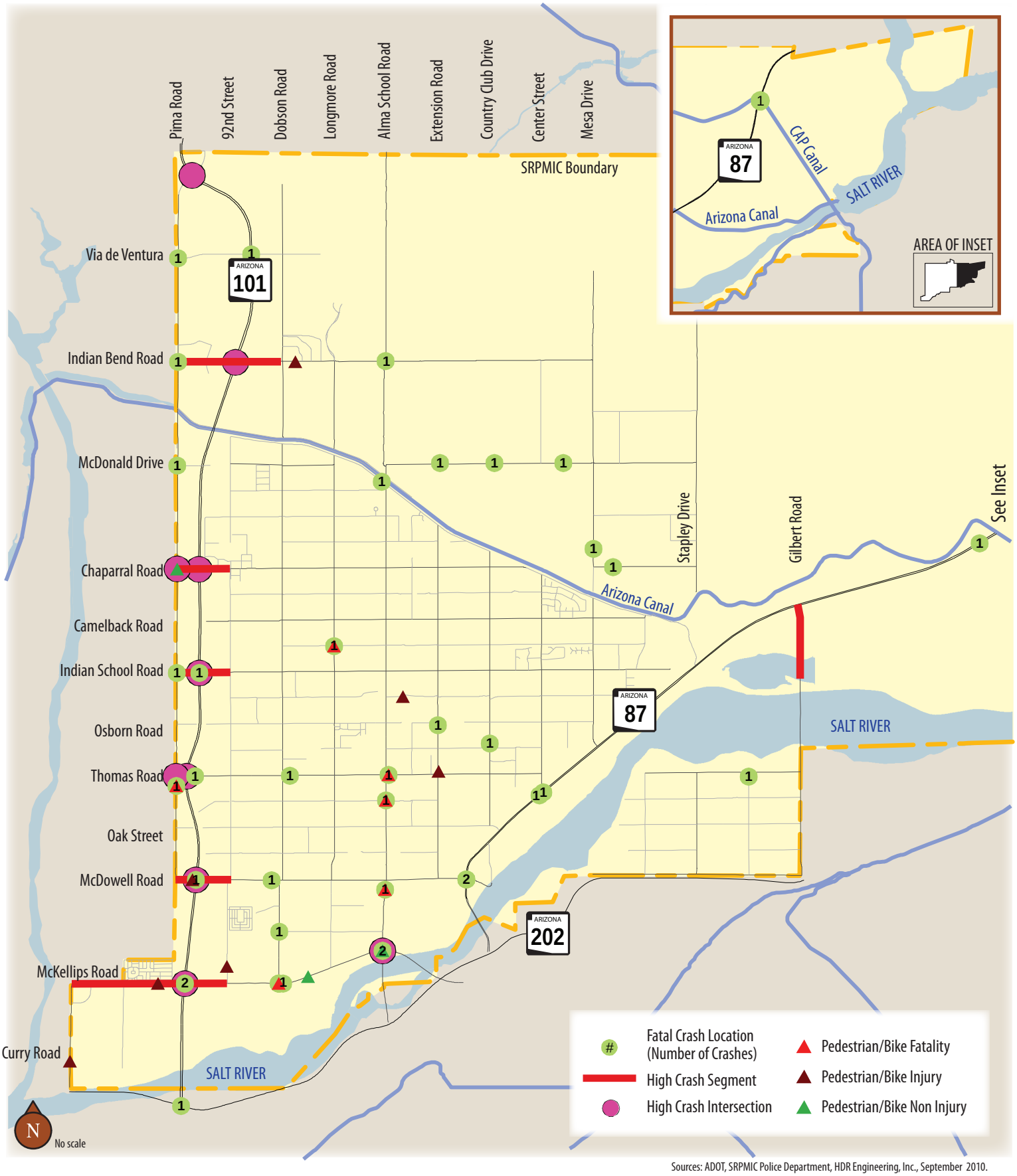
Approximately 90 percent of reported crashes occurred under dry roadway conditions and the rest occurred when the roadway was wet or during other conditions.

SRPMIC PD Data

The data provided by SRPMIC PD did not have information about environmental conditions.

Crash Hot Spot Locations

Crashes were analyzed at intersections as well as at mid-block sections to identify high crash locations within the study area. Both the ADOT and SRPMIC databases were analyzed to identify high crash locations within the study area. Figure 12 shows the high crash locations identified in the study area. The figure also shows the fatal crash locations along with bicycle and pedestrian crash locations.



Sources: ADOT, SRPMIC Police Department, HDR Engineering, Inc., September 2010.

FIGURE 12 | High Crash Locations

High Crash Intersections

Table 6 shows the top 10 ranked high crash intersections from both the ADOT and SRPMIC databases. This ranking was prepared by combining the top-ranked high crash intersections from each database.

Table 6 High Crash Intersections

Rank[a]	Intersection	Number of Crashes[b]
1	Pima Freeway-McKellips Road	63 (166)
1	Pima Freeway-Chaparral Road	63 (162)
3	Pima Freeway-McDowell Road	38 (148)
4	Pima Freeway-Indian School Road	32 (121)
5	Pima Freeway-Indian Bend Road	27 (132)
6	Pima Freeway-90th Street	23 (100)
7	Pima Freeway-Thomas Road	18 (54)
8	Thomas Road-Pima Road	15 (84)
9	Pima Road-Chaparral Road	13 (54)
10	SR 87- Gilbert Road	6 (74)

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009); SRPMIC Police Department, data from January 1, 2005 through July 16, 2009 (July 2009).

Notes: a) Rank based on crashes in ADOT database.
b) ADOT crashes with SRPMIC PD crashes in parentheses.

Nine of the ten top ranked high crash intersection locations are the same in both the ADOT and SRPMIC PD databases. The exceptions are the McKellips Road- Alma School Road intersection in the ADOT list and SR 87-Gilbert Road intersection in the SRPMIC PD list. Furthermore, SRPMIC PD has indicated that the intersections of McKellips Road-Dobson Road and Via de Ventura-Dobson Road are other high crash intersections.

To understand the different crash characteristics at these high crash locations, crash type and crash rates were analyzed at each location. Table 7 below summarizes the high crash locations from the ADOT database with crash rates and crash types. SRPMIC PD data does not have information on crash types and therefore, are not analyzed.

Table 7 Crash Types and Crash Rates at High Crash Intersections (ADOT Data)

Location	# of Crashes	Angle	Rear End	Sideswipe	Single Vehicle	Other
Pima Freeway-Chaparral Road	63	47 (75%)	11 (17%)	1 (2%)	2 (3%)	2 (3%)
Pima Freeway-McKellips Road	63	36 (57%)	19 (30%)	3 (5%)	3 (5%)	2 (3%)
Pima Freeway-McDowell Road	38	18 (47%)	11 (29%)	3 (8%)	6 (16%)	0 (0%)
Pima Freeway-Indian School Road	32	12 (38%)	10 (31%)	3 (9%)	6 (19%)	1 (3%)
Pima Freeway-Indian Bend Road	27	17 (63%)	6 (22%)	4 (15%)	0 (0%)	0 (0%)
Pima Freeway-Thomas Road	23	10 (44%)	7 (30%)	4 (17%)	2 (9%)	0 (0%)
McKellips Road-Alma School Road	18	7 (39%)	8 (43%)	1 (6%)	1 (6%)	1 (6%)
Thomas Road-Pima Road	15	12 (80%)	3 (20%)	0 (0%)	0 (0%)	0 (0%)
Pima Freeway-90th Street	14	5 (36%)	7 (50%)	1 (7%)	0 (0%)	1 (7%)
Pima Road-Chaparral Road	13	7 (53%)	4 (31%)	1 (8%)	1 (8%)	0 (0%)

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

High Crash Segments

High crash segments were also identified in the study area and are shown in Figure 12. As shown in the figure, all the high crash segments are located along Pima Freeway interchanges at arterial streets except for one located along Gilbert Road from SR 87 to BIA 740 north of the Salt River. Table 8 summarizes the high crash segments with 10 or more crashes during the five year study period from June 1, 2003 to May 31, 2008 for the data provided by ADOT. SRPMIC PD data does not have enough information on crash locations to identify high crash segments and so it was not analyzed.

Table 8 High Crash Segments (ADOT Data)

Location	# of Crashes	Angle	Rear End	Sideswipe	Single Vehicle	Other
Indian Bend Road from Pima Road to Dobson Road	34	20 (58%)	5 (15%)	4 (12%)	4 (12%)	1 (3%)
Chaparral Road from Pima Road to 92nd Street	32	6 (19%)	20 (62%)	5 (16%)	0 (0%)	1 (3%)
McDowell Road from Pima Road to 92nd Street	21	1 (5%)	13 (61%)	1 (5%)	5 (24%)	1 (5%)
Gilbert Road from SR 87 to BIA 740	17	1 (6%)	3 (18%)	1 (6%)	11 (64%)	1 (6%)
Indian School Road from Pima Road to 92nd Street	11	5 (46%)	4 (36%)	1 (9%)	1 (9%)	0 (0%)
McKellips Road from Hayden Road to Roosevelt Street	11	1 (9%)	6 (55%)	2 (18%)	2 (18%)	0 (0%)

Source: ADOT Traffic Safety Division, data from June 1, 2003 to May 31, 2008 (July 2009).

Fatal Crash Locations

A total of 42 fatal crashes occurred in the study area during the analysis period from June 1, 2003 to July 16, 2009 per both ADOT and SRPMIC PD data. Figure 12 shows the fatal crash locations in the study area. The McKellips Road and Dobson Road intersection has the highest number of fatal crashes with four. There were two fatal crashes at each of the following intersections of McKellips Road-Pima Freeway, McKellips Road-Alma School Road and SR 87-McDowell Road.

Pedestrian-Bicycle Crash Locations

There were 13 pedestrian and bicycle crashes in the study area during the analysis period from June 1, 2003 to May 31, 2008 per ADOT data. Figure 12 shows the pedestrian and bicycle crash locations in the study area. As shown in the figure, a majority of pedestrian crashes occurred along McKellips Road and Alma School Road.

Crash Observations at High Crash Intersections

Based on evaluation of the crash data, interviews with SRPMIC PD, and field observations, the HDR study team reviewed conditions at the high crash intersections and identified near-term corrective measures to mitigate potential safety hazards. This section first discusses the intersection conditions and then addresses potential corrective measures.

Pima Freeway-Chaparral Road

There were a total of 63 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Angle type crashes (75 percent) were the predominant type of crash followed by rear end crash (17 percent). Failure to yield the right of way and driver inattention were reported as primary causes of the crashes. Crash analysis also shows that about 28 percent of crashes occurred during dark or unknown lighting conditions. According to the SRPMIC PD, left turn violations and speeding were the primary causes of crashes at this intersection. Left turns from Chaparral Road into the Scottsdale Community College campus, left turns off of the freeway towards the college campus and exiting traffic from Wal-Mart on Chaparral Road were some of the movements that were involved in crashes. It is also noted that the left turn traffic from Chaparral Road into the college campus is heavy.

The SRPMIC PD database shows that 162 crashes occurred near the Pima Freeway-Chaparral Road traffic interchange between January 1, 2005 and July 16, 2009.

Pima Freeway-McKellips Road

There were a total of 63 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. There were two fatal crashes recorded at this intersection per the crash database provided by SRPMIC PD. Angle type crashes (57 percent) and rear end crashes (30 percent) were the predominant type of crash at this intersection. Failure to yield the right of way and driver inattention were reported as primary causes of the crashes. Crash analysis also shows that about 57 percent of crashes occurred during dark or unknown lighting conditions. According to the SRPMIC PD, speeding and left turn violations were the primary causes of crashes at this intersection. It is also noted that there is cut-through traffic from East Valley cities using this intersection.

The SRPMIC PD database shows that 166 crashes occurred near the Pima Freeway-McKellips Road traffic interchange between January 1, 2005 and July 16, 2009.

Pima Freeway-McDowell Road

There were a total of 38 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. There was one fatal crash at this intersection per the crash database provided by SRPMIC PD. Angle type crashes (47 percent) and rear end crashes (29 percent) were the predominant type of crash at this intersection. Driver inattention and disregarding traffic signals were reported as primary causes of the crashes. Crash analysis also shows that about 47 percent of crashes occurred during dark or unknown lighting conditions. According to the SRPMIC PD, speeding, left turn violations and red light running were the primary causes of crashes at this intersection. It was also observed that some crashes were due to vehicles hitting the raised curb and monument at the intersection.

The SRPMIC PD database shows that 148 crashes occurred near the Pima Freeway-McDowell Road traffic interchange between January 1, 2005 and July 16, 2009.

Pima Freeway-Indian School Road

There were a total of 32 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. There was one fatal crash at this intersection per the crash database provided by SRPMIC PD. Angle type crashes (38 percent) and rear end crashes (31 percent) were the predominant type of crash at this intersection. Driver inattention and disregarding traffic signals were reported as primary causes of the crashes. Crash analysis also shows that about 44 percent of crashes occurred during dark or unknown lighting conditions. According to the SRPMIC PD, left turn violations were the primary causes of crashes at this intersection.

The SRPMIC PD database shows that 121 crashes occurred near the Pima Freeway-Indian School Road traffic interchange between January 1, 2005 and July 16, 2009.

Pima Freeway-Indian Bend Road

There were a total of 27 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Angle type crashes (63 percent) and rear end crashes (22 percent) were the predominant crash type at this intersection. Disregarding traffic signals was reported as the primary cause of the crashes. Crash analysis also shows that about 33 percent of crashes occurred during dark or unknown lighting conditions. According to the SRPMIC PD, failure to yield was the primary cause of crashes at this intersection.

The SRPMIC PD database shows that 132 crashes occurred near the Pima Freeway-Indian Bend Road traffic interchange between January 1, 2005 and July 16, 2009.

Pima Freeway-Thomas Road

There were a total of 23 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Angle type crashes (44 percent) and rear end crashes (30 percent) were the predominant type of crash at this intersection. Disregarding traffic signals and driver inattention were reported as the primary causes of the crashes. According to the SRPMIC PD, left turn violations and eastbound red light running were the primary causes of crashes at this intersection. Some crashes occurred due to vehicles hitting raised curbs. It is noted that the closely spaced signalized intersections between Pima Road and Pima Freeway were creating confusion for the drivers.

The SRPMIC PD database shows that 100 crashes occurred near the Pima Freeway-Thomas Road traffic interchange between January 1, 2005 and July 16, 2009.

McKellips Road-Alma School Road

There were a total of 18 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. There were two fatal crashes at this intersection per the crash database provided by SRPMIC PD. Rear end crashes (43 percent) and angle type crashes (39 percent) were the predominant type of crash at this intersection. Driver inattention and disregarding traffic signals were reported as the primary causes of the crashes. According to the SRPMIC PD, this is a major injury crash location with speeding and red light running being the primary causes of crashes at this intersection.

The SRPMIC PD database shows that 54 crashes occurred near the McKellips Road-Alma School Road traffic interchange between January 1, 2005 and July 16, 2009.

Thomas Road-Pima Road

There were a total of 15 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Angle type crashes (53 percent) and rear end crashes (31 percent) were the predominant types of crash at this intersection. Disregarding traffic signals was reported as the primary cause of the crashes.

The SRPMIC PD database shows that 84 crashes occurred near the Thomas Road-Pima Road traffic interchange between January 1, 2005 and July 16, 2009.

Pima Freeway-90th Street

There were a total of 14 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Rear end crashes (50 percent) were the predominant type of crash at this intersection. Driver inattention and disregarding traffic signals were reported as the primary causes of the crashes. According to the SRPMIC PD, rear-end crashes on northbound right turns off of the freeway waiting for a gap was the movement that was mostly involved in crashes.

The SRPMIC PD database shows that 107 crashes occurred near the Pima Freeway-90th Street traffic interchange between January 1, 2005 and July 16, 2009.

SR 87 (Beeline Highway)-Gilbert Road

There were a total of 6 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Rear end crashes (83 percent) and angle type crashes (17 percent) were the predominant type of crash at this intersection. The primary cause of the crashes was speed too fast for conditions and disregarding the traffic signals.

The SRPMIC PD database shows that 74 crashes occurred near the SR 87-Gilbert Road traffic intersection between January 1, 2005 and July 16, 2009.

Pima Road-Chaparral Road

There were a total of 13 crashes reported at this intersection in the ADOT database over the five year analysis period between June 1, 2003 and May 31, 2008. Angle type crashes (54 percent) and rear end crashes (30 percent) were the predominant type of crash at this intersection. Driver inattention was reported as the primary cause of the crashes.

The SRPMIC PD database shows that 74 crashes occurred near the Pima Freeway-Chaparral Road traffic interchange between January 1, 2005 and July 16, 2009.

Corrective Measures

Most of the crashes at these high crash intersections occurred due to the driver inattention. Some of the potential corrective measures that can be made to reduce these types of crashes occurring at intersections include:

a) Install a raised median on Chaparral Road between the Pima Freeway traffic interchange and Pima Road.

b) Install Recessed Pavement Markers (RPM) along lane markings, rumble strips along edge lines of the roadway to obtain driver attention.

c) Flexible reflective delineators and lighted flexible boulder signs should be considered along painted island curbs at tight left turn movements to obtain driver attention.

d) Optically programmed signal heads should be considered for eastbound and westbound traffic at Thomas Road-Pima Road and Thomas Road-Pima Freeway traffic interchange.

e) A modern roundabout could be an alternative for an intersection with history of crashes due to left turns and higher speeds. It would also serve as a traffic calming measure.

2.8 Public Transit

Salt River Transit

Public transportation serves a variety of functions for the SRPMIC. It gives mobility to persons without access to an automobile and to those who do not drive and it provides important links between rural communities and metropolitan areas. According to the 2000 Census, 13 percent of SRPMIC households had no vehicle available, one-third of the Community is under 18 years of age, and an additional 12 percent are over 65 years of age.

The Salt River Pima-Maricopa Indian Community Transit System (SRTS) provides dial-a-ride services for tribal residents traveling to Mesa, Tempe, and Scottsdale for shopping, employment, medical and social services. Salt River Transit has been providing transit services to Community members since 1983.

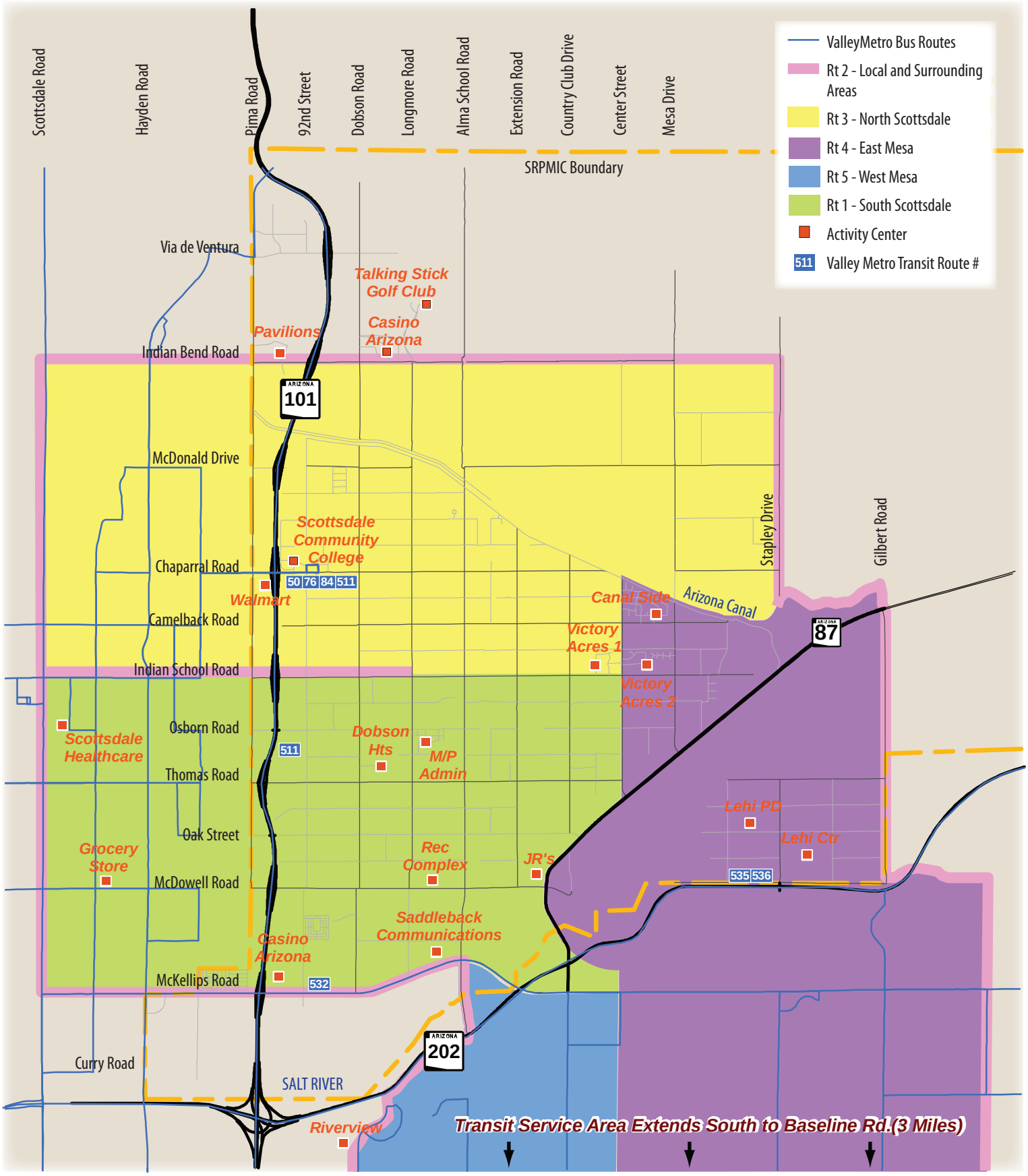
The mission statement of the SRTS is:

> *"The transit system provides safe and efficient transportation service to residents, tribal employees and the general public to the SRPMIC. Our primary purpose and continued goal is to provide service and assistance to residents in reaching destinations such as medical facilities, employment centers, education facilities, shopping centers and other areas."*

Review of summary ridership information provided by the Community shows that ridership numbers are stable with little monthly fluctuation. Community staff reported there is a noticeable drop in ridership when quarterly benefit checks are received, but levels quickly adjust back to baseline.

Existing Service Route Descriptions

The current service routes have been developed over time addressing the needs of the Community members, resulting in a rider base that is stable and predictable. Figure 13 shows their areas of coverage and the surrounding Valley Metro Transit service. Table 9 describes the service routes.



Sources: SRPMIC, ValleyMetro, HDR Engineering, Inc., September 2010.

FIGURE 13 | Existing Transit Service Areas

Table 9 Service Areas and Descriptions

Route	Name	Description
1	South Scottsdale	South of Indian School Road, north of McKellips Road, west of Center Street, east of Scottsdale Road.
	service time	6:00am to 9:30am, 12pm to 3:30pm
2	Local and Surrounding Areas	North of Baseline Road, south of Indian Bend Road, west of Stapley Drive, east of Scottsdale Road
	service time	6:30am to 12:30am, 3:30pm to 5:30pm
3	North Scottsdale	North of Indian School Road, south of Indian Bend Road, west of Lindsey Road, east of Scottsdale Road
	service time	5:30am to 9:30am, 1:30pm to 5:30pm
4	East Mesa	North of Baseline Road, south of Arizona Canal, west of Lindsey Road, east of Center Street
	service time	5:00am to 9:00am, 1:30pm to 5:30pm
5	West Mesa	North of Baseline Road, south of McKellips Road, west of Center Street, east of Dobson Road
	service time	6:00am to 10:00am, 1:00pm to 5:00pm

Source: Salt River Pima-Maricopa Indian Community Transportation Department, Transit Division (2009).

As can be seen in Figure 13, the service area boundaries of the current routes cover most of the areas of residential and commercial development within the Community (with the notable exception of the commercial development north of Indian Bend Road). The service areas extend beyond the Community boundaries to provide transportation to important destinations for Community members including Scottsdale Healthcare and regional shopping centers. Important destinations identified by SRTS staff include the following (in no particular order):

- Fiesta Mall, Mesa
- Sycamore/Main Street Light Rail Transit Stop, Mesa
- Riverview Mall, Mesa
- Fry's Food Store 77th Street and E McDowell Road, Scottsdale
- Pavilions, Indian Bend and Pima Freeway, Scottsdale
- Scottsdale Healthcare, Scottsdale
- SRPMIC Tribal Complex
- Casino Arizona, McKellips
- Scottsdale Community College, Chaparral

Transfer points for SRTS to Valley Metro routes include:

- McDowell and Granite Reef Road (Valley Metro Route 17, McDowell Road)
- Hayden and Thomas (Valley Metro Route 29, Thomas Road)
- Scottsdale Community College (Valley Metro Route 50, Camelback Road; and 76, Miller Road
- Country Club Drive and McKellips (Valley Metro Route 112, Country Club Drive/Arizona Avenue)
- The Pavilions

The SRPMIC Department of Transportation director has been in contact with Valley Metro staff to discuss the opportunity for the extension of Valley Metro service to the Tribal Headquarters at Longmore and Osborne. SRTS trips beyond the Community could transfer to Valley Metro from these locations. Current economic conditions have delayed action on this, but interest exists to continue to explore this option.

Transit Planning

In 2009 ADOT prepared the Salt River Transit Five Year Plan (Transit Plan). This Plan, prepared in support of the 5311 funding received from ADOT, identifies the Community's goals for transit, transit demand, and a five-year implementation plan.

The plans provide a five-year 'road map' to address the transportation needs and coordination of public transportation and specialized transportation services for the elderly and disabled in the regions. In addition, they address the most efficient and effective management and funding programs for public transportation. These plans include an assessment of local transit needs within a five-year "horizon," achievable coordination and consolidation opportunities and a significant public involvement process.

As part of the Transit Plan a rider survey was conducted in November 2008. The survey found that the primary trip purpose of riders is employment (35 percent), followed by education (20 percent) and medical purposes (17 percent). The survey found that all respondents would like to see weekend service and many asked that weekday service be extended to 7 p.m. Eighty-five percent of the riders ride Monday-Friday. This finding was confirmed by comments during outreach with a Tribal Council district meeting that suggested an extension of service to 9 or 10 p.m.

The Transit Plan also assessed the transit dependent population within the Community, based on the work done in ADOT's Arizona Rural Transit Needs Study (May 2008). This study determined transit dependent populations and demand by County for the entire state based upon the Arkansas Public Transportation Needs Assessment (APTNA) method[4]. The Transit Plan estimated the transit dependent population within the Community, using SRPMIC's population relative to the total rural Maricopa County population. For this study, we have evaluated the transit dependent population by direct application of the 2000 Census data.

Transit Funding

Funding for rural transit services comes from several sources: the Federal Transit Administration (FTA) Section 5311 Rural Transportation funds and the SRPMIC. For the 2009 operating year, approximately 60 percent funding came from Section 5311 grant funding with the remaining 40 percent coming directly from the SRPMIC.

[4] *The Arkansas Public Transportation Needs Assessment (APTNA) method represents the demand for transit service by applying trip rates to three population groups: elderly persons ages 60 and over, persons with disabilities under age 60, and persons living in poverty under age 60.*

The current fare structure for each one-way trip is shown in Table 10. Although the fares are relatively low in comparison to other rural transit providers, there is a strong commitment to maintaining an inexpensive transportation option for Community members.

Table 10 SRPMIC Fare Structure

One-Way Trip Fares	General	Seniors/Disabled
Within the Community	$.75	$.25
Outside the community	$.85	$.50

Source: Salt River Pima-Maricopa Indian Community Transportation Department, Transit Division (2009).

Rural Public Transportation Program (Section 5311)

The Section 5311 Rural Public Transportation Program provides capital, administrative and operating assistance for public transportation programs in rural and small urban areas.

FTA Section 5311 funding supports capital expenditures, operating expenses, and administrative expenses. A local match is required with the amount varying by program. They may be used for general public transit services in rural areas (those areas with less than 50,000 in population). The FTA apportionment funding is allocated to states on a population-based formula. The ADOT Multimodal Planning Division awards the funds to participating systems through an annual competitive application process and acts as administrator for the 5311 program. Besides the SRPMIC, the Hopi Tribe and Navajo Nation are the only tribes in Arizona currently receiving Section 5311 grant funding.

Recommendations from ADOT's 5-year plan focus on five key areas: 1) management structure and administration, 2) effectiveness of service, 3) marketing, 4) coordination (both locally and within the region), and capital planning. The reader may refer to that plan, on file with the Transit Department, for specifics and recommendations.

Operations Information

The SRTS fleet currently includes nine vehicles: (3) 14 Foot Passenger Vans, (1) 13 Foot Passenger Van, and, (5) 11 Foot Passenger Vans. These vehicles were all purchased with Community funds. Table 11 shows SRTS service data for Fiscal Year 2008. Table 12 shows the SRPMIC transit costs for Fiscal Year 2008.

Table 11 Service Data for Fiscal Year 2008

Service Measure	Amount
Service Days per Week	5
Annual Revenue Miles	141,136
Annual Passenger Trips	22,419
Fares Collected	$16,126
Vehicle Revenue Hours	9,464
Cost per Passenger Trip	$22.75
Cost per Revenue Mile	$3.61

Source: ADOT, Fiscal Year 2008 Section 5311 Annual Report.

Table 12 SRPMIC Transit Costs for Fiscal Year 2008

Cost Type	Federal	Percent	SRPMIC	Percent	Total	Percent
Operating	$184,458	77	$213,570	79	$398,184.00	78
Administration	$55,619	23	$56,324	21	$111,943	22
Capital	$0		$0		0	
Total	$240,077.00	100	$269,894.00	100	$509,971	100

Source: ADOT, Fiscal Year 2008 Section 5311 Annual Report.

Transit Dependent Populations

For the vast majority of trips produced and/or attracted in the SRPMIC area, there are few viable alternatives to the automobile. Segregation of land uses and nearly universal automobile availability has resulted in dispersed land uses that are difficult to reach without an automobile, as well as little or no alternate modes of travel. Not only is there little public transportation service available, the distances between origin and destination and lack of facilities for pedestrians and bicyclists makes walking or riding a bicycle impractical and/or unsafe. In most cases, about the only viable alternative to driving somewhere is riding there with someone else.

Transit Demand

Using the APTNA, populations of elderly persons age 60 and over, persons with disability under the age of 60, and persons living in poverty under age 60 are considered transit dependent populations. Within the SRPMIC Community an assessment of these populations indicates that as much as 60 percent of the population would be considered transit dependent[5].

To determine the potential demand for transit services, the APTNA assessed trip rates based on Census information, which was reported as an annual trip rate for each group. The findings are reported in Table 13.

[5] *This is based on Census 2000 information for the SRPMIC which reveals 16 percent of the population is over age 60; 28 percent of the population under 65 is in poverty; and an additional 19 percent of the age 5 to 65 population has a disability. Adjusting for the population of the last two groups over 60, the resulting transit dependent population is equivalent to 60 percent of the Community's population.*

Table 13 Annual Transit Trip Rates for Select Demographic Groups

Demographic Group	Trip Rates: Annual One-Way Passenger Trips
Elderly persons Age 60 and Over	6.79
Persons with Disability Under Age 60	4.49
Persons living in Poverty Under Age 60	20.5

Source: Salt River Transit Five-Year Plan, January 2009.

Using these trip rates, it was determined that the 2009 transit demand estimate for the SRPMIC Community is 48,377. When compared to the 22,419 annual passenger trips recorded in 2008, this estimate represents an additional 26,000 trips (116 percent additional annual trips) of current unmet transit demand.

2.9 Non-Motorized Transportation

Today, there are few paved or un-paved trails within the SRPMIC. The rural character of the Community, characterized by its narrow roads with no curb or gutter, requires pedestrians to walk along edge of pavement and in some cases where obstructions or canal laterals exist, pedestrians have to walk on the pavement.

Sidewalks are present only in some of the newer developments, subdivisions within the People's Village, around some of the commercial development in the Pima Freeway corridor and at the Government Complex. Even with the sidewalks in place adjacent to some of the denser subdivisions, there is little connectivity with schools or activity centers. The 2006 SRPMIC General Plan includes a number of objectives and implementation measures addressing the need for improved pedestrian connectivity. Figure 14 shows the Salt River Elementary School, one of the few locations with sidewalks.

Figure 14 Salt River Elementary School Sidewalks

The General Plan identifies the creation of a trails master plan to connect activity areas for pedestrians, bicyclists, and equestrians within the Community as one of the Actions/Implementation Measures (IM 24, SRPMIC General Plan, 2006).

3.0 Land Use and Socioeconomic Conditions

This section provides an overview of the existing land use together with estimates of SRPMIC population and employment. The demographic information used in this analysis is from the 2000 Census. While this information is nearly ten years old, the 2000 Census remains the most comprehensive source of demographic data available. When appropriate and available, other more recent socioeconomic information is cited.

Demographic information is important in developing a profile of the Community's residents and households. A comparative analysis with data from the county and state is included to illustrate how SRPMIC relates to the greater metropolitan area and state.

3.1 Title VI and Environmental Justice

The Environmental Protection Agency and FHWA define environmental justice as the "fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies." Environmental justice principles and procedures are followed to improve all levels of transportation decision making. Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin. The 1994 Executive Order 12898 on environmental justice addresses minority and low-income populations. The rights of women, the elderly, and the disabled are protected under related statutes. These Presidential Executive Orders and other related statutes fall under the umbrella of Title VI.

There are three fundamental environmental justice principles applicable to the transportation project development process:

- to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- to ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- to prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

Effective transportation decision making depends on understanding and properly addressing the unique needs of different socioeconomic groups. Properly implemented, environmental justice principles and procedures improve all levels of transportation decision making.

The five minority groups addressed by Title VI and Executive Order 12898, Environmental Justice, are:

- Black (a person having origins in any of the black racial groups of Africa)
- Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race)
- Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands)
- American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition)
- Some other race, or persons of more than one race

A member of the low-income population is defined as "a person whose household income is at or below the Department of Health and Human Services poverty guidelines." The Department of Health and Human Services poverty guidelines state that the poverty level for a family of four in 2009 is $22,050 (note, however, that this income level cannot be compared directly with current income levels because the value of money changes year to year).

Other protected populations include concentrations of elderly, the disabled and female heads of households. These populations for the SRPMIC Community, Maricopa County and Arizona are shown in Table 14.

Table 14 Title VI and Environmental Justice Population Percentages, SRPMIC, Maricopa County and Arizona

Category	Arizona	Maricopa County	SRPMIC
Minority	36.2%	33.8%	82.5%
Hispanic or Latino	25.3%	24.8%	16.9%
Black or African American	2.8%	3.5%	0.4%
American Indian or Alaskan Native	4.5%	1.5%	45.6%
Asian	1.7%	2.1%	0.1%
Native Hawaiian or Other Pacific Islander	0.1%	0.1%	<0.1%
Some Other Race	0.1%	0.1%	10.6%
More than One Race	1.6%	1.7%	8.8%
Persons Living Below the Poverty Level	13.9%	11.7%	30.5%
Disabled	19.3%	18.0%	27.7%
Age 65 and Older	13.0%	11.7%	12.5%
Female Heads of Household	6.8%	6.6%	14.1%

Source: Census 2000 Redistricting Data (PL94-171) Summary File.

The protected populations considered in this analysis are described below:

- Minority populations include people who identify themselves as Hispanic or Latino, Black or African American, American Indian and Alaskan Native, Asian, Native Hawaiian and Other Pacific Islander, persons of some other race, or persons of more than one race.
- Low-income populations include people living in households with an income at or below the U.S. Department of Health and Human Services poverty guidelines. Low-income populations may have greater difficulty locating replacement housing in the area. They may rely on public services and facilities, such as public transit and public recreational amenities, to a greater extent than the general population.
- Elderly populations consist of people who are age 65 and older. While elderly citizens often drive, the National Highway Traffic Safety Administration (NHTSA) reports that both high-speed and high-traffic routes may present a problem for some (NHTSA, 2007). In addition, the elderly may have a need for transit service or may opt to use transit if it is offered.
- Disabled populations are civilian, non-institutionalized persons aged 5 and over with disabilities (such as sensory, physical, mental, self-care, going outside of home, and

employment disabilities).

- Female head-of-household populations consist of households headed by a female with no husband present and with her own children under the age of 18. These households tend to have lower incomes than households headed by married couples or a single man and oftentimes have a greater need for affordable housing.

Poverty is a major concern of the Salt River Pima-Maricopa Indian Community with the median per capita income of $9,592 (more than 56 percent below the national per capita income of $22,000). The percentage of the population in poverty is 30.5 percent, more than twice that of the overall state poverty level of 14 percent.

3.2 Existing and Planned Land Use

The Community is rural in character with over 90 percent of the area classified as either open space or vacant. Commercial and industrial development is limited to the periphery of the Community along major transportation corridors. The Community encompasses approximately 85 square miles (54,632 acres), with 19,000 held as a natural preserve and approximately 17,000 acres under cultivation in a variety of crops including cotton, melons, potatoes, onions, broccoli and carrots.

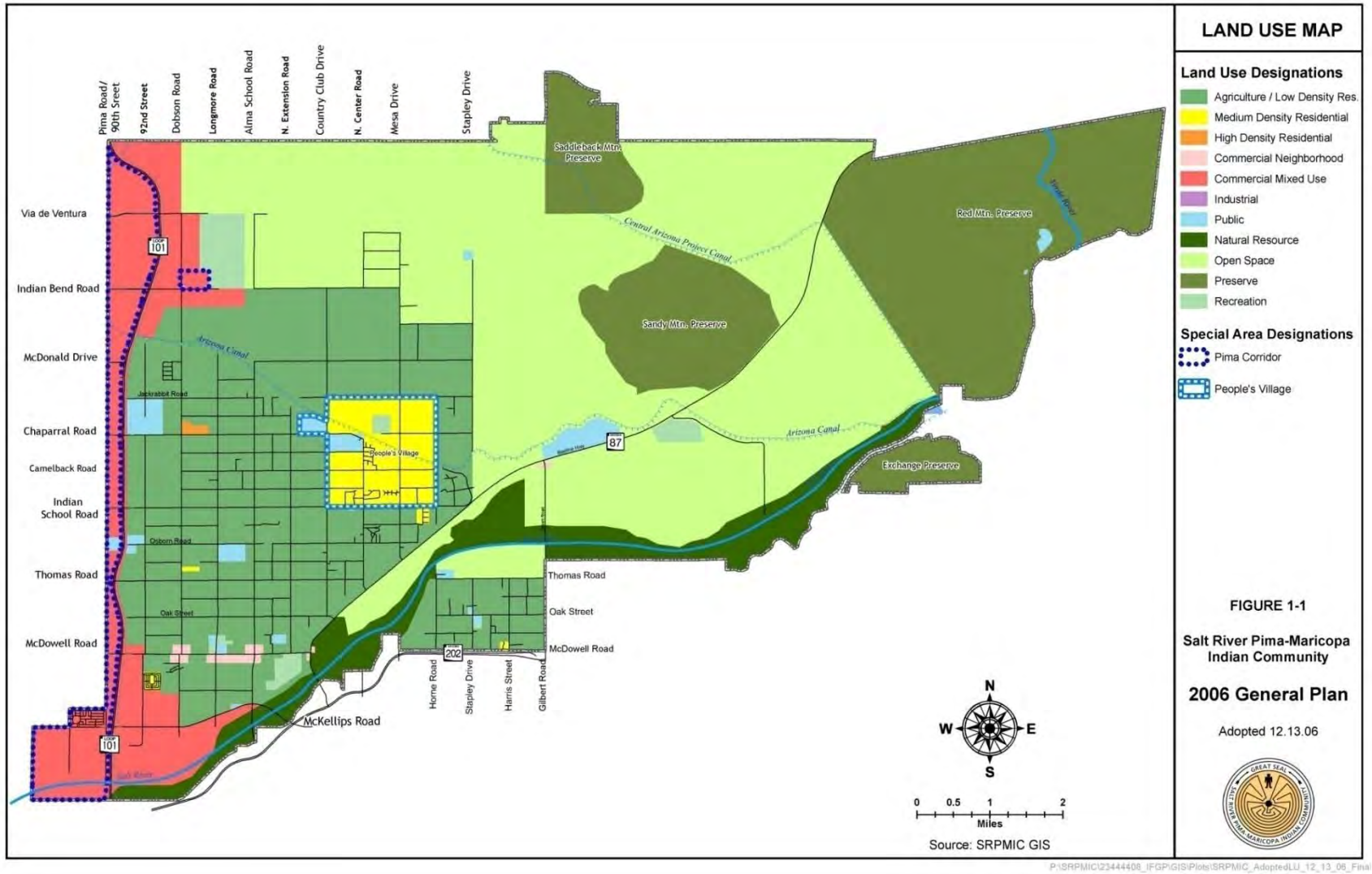
Table 15 Existing SRPMIC Land Use

Land Use	Acres	Percent
Residential	1,641	3.0
Commercial	458	0.8
Industrial	6	<0.1
Office	22	<0.1
Public use	430	0.8
Transportation, Canal, Utility	819	1.5
Open Space	45,477	83.2
Mining & Landfill	1,819	3.3
Vacant	3,960	7.3
Total	54,632	100.0

Source: SRPMIC General Plan, December 13, 2006.

The SRPMIC General Plan Land Use Map shown in Figure 15 identifies 11 planned land use designations and two special area designations for the Pima Freeway corridor and the People's Village. The Pima Freeway corridor is the Community's economic growth area. It extends north-south along the Pima Freeway from McKellips Road to the Community's northern boundary. The People's Village, located in the heart of the Community, is intended to be a Community-oriented focal point of activity.

Figure 15 2006 General Plan Land Use Map



3.3 Traffic Analysis Zones

Traffic analysis zones (TAZ) are geographic areas generally bounded by roads, railroads, major watercourses or other easily identifiable physical features. SRPMIC socioeconomic data is tabulated by TAZ geography. Using the City of Scottsdale Travel Demand Model (STDM), traffic is generated by each land use within the TAZ, distributed, and then assigned to the roadway network. Subsequently, using projected land use data, future traffic forecasts can be derived.

3.4 Population

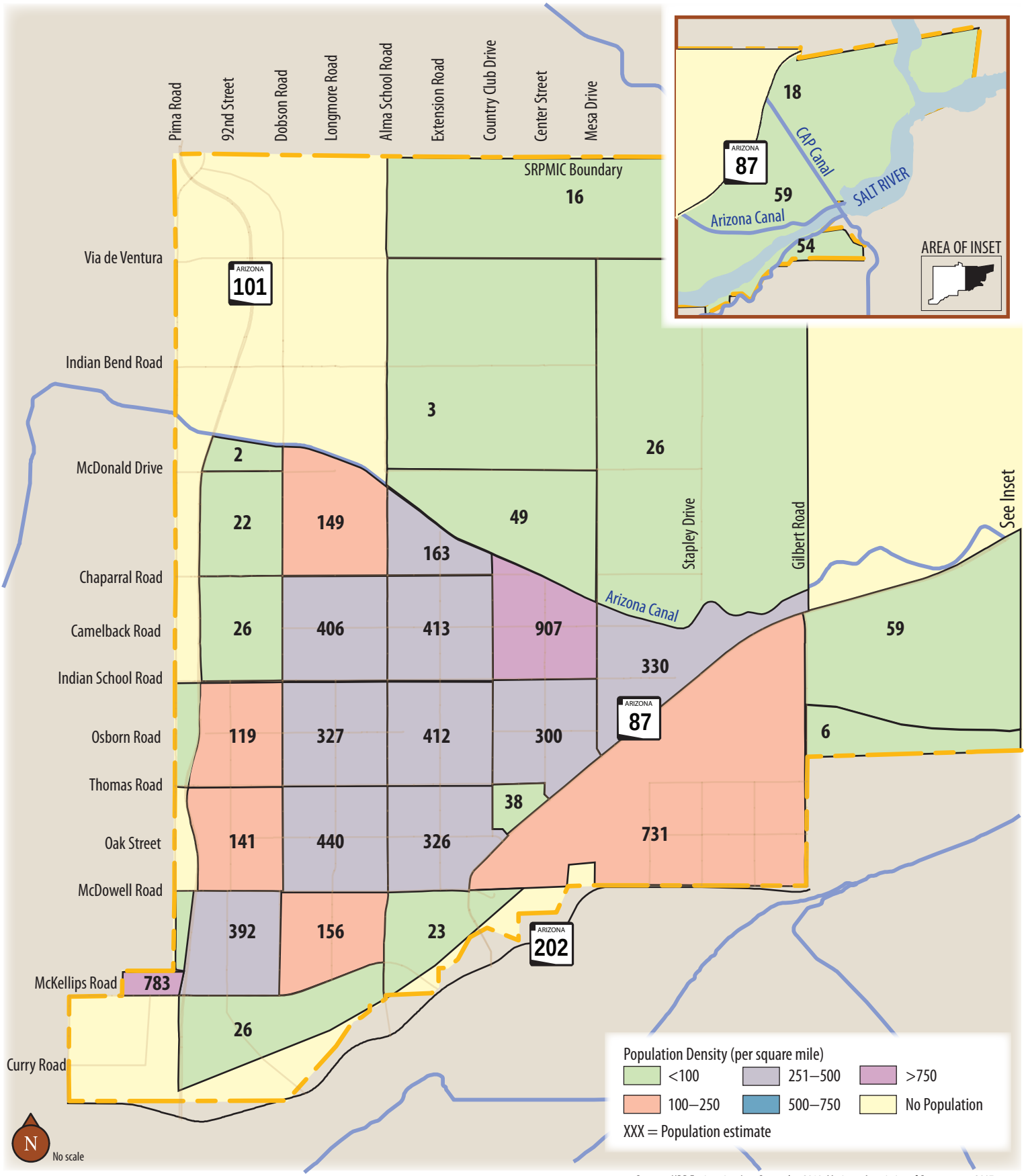
It is estimated that approximately 7,188 of the Communities 8,976 members live on the reservation[6]. The U.S. Census reported a 2000 population of 6,405. Many members live on scattered home-sites largely located south of the Arizona Canal, which essentially bisects the Community east-west; in the Lehi area, located south of the Salt River; and in the People's Village, a two and one-quarter square mile area that is developing as a focal point of activity for Community members.

The median age of the SRPMIC population is 28.3, compared with 34.2 for Arizona. Much of the population is young with 39.7 percent of the population under 20 years of age. For Arizona as a whole, 29.7 percent of the population is under 20 years of age. This is important information because age helps dictate transportation mode choice and walking rates are drastically higher for younger age groups than older ones. The 5–15 year old age group has almost twice the percentage of walking trips as the 40–64 year old age group[7].

The average household size in the Community is 3.24 persons per household, 20 percent higher than that of Maricopa County (average household size is 2.67; slightly higher than Arizona as a whole, which is 2.64). Figure 16 shows the estimated 2006 SRPMIC population density by TAZ.

[6] The reported population of 8,976 members is from the Salt River Pima-Maricopa Indian Community's Enrollment Office. The 2009 population estimate is extrapolated from the 2000 Census population and the Maricopa Association of Governments' 2007 socioeconomic projections.

[7] Pucher, J. and Renne, J. (2003). Socioeconomics of Urban Travel: Evidence from the 2001 NHTS. Transportation Quarterly, Vol. 57, No. 3, Summer 2003 (49–77).



Sources: HDR Engineering, Inc., September 2010; Maricopa Association of Governments, 2007.

FIGURE 16 | 2030 Estimated Population Density by TAZ

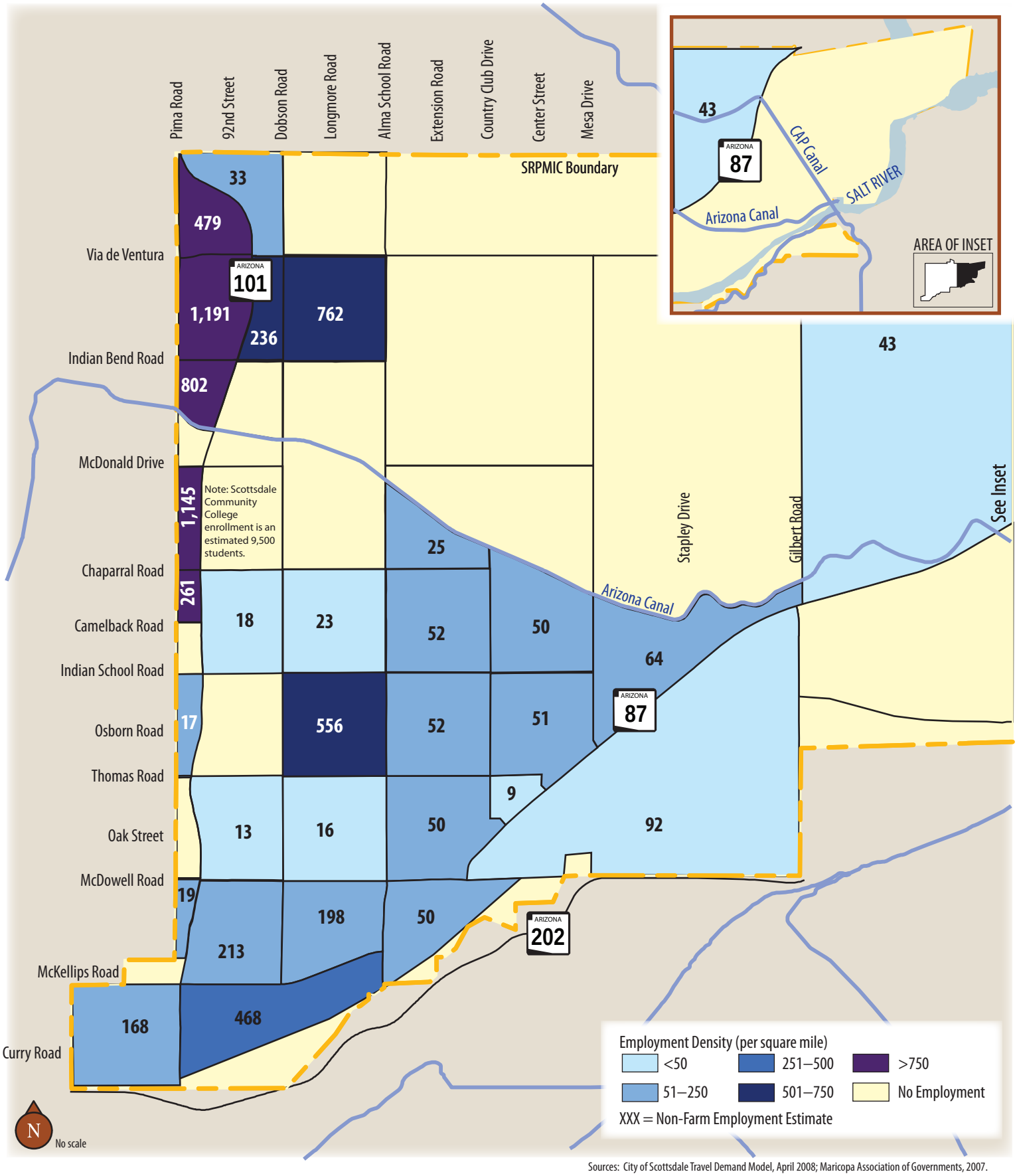
3.5 Employment

The SRPMIC is home to a diverse and large employment base. Table 16 summarizes employment information for the Community. Figure 17 shows the estimated 2006 SRPMIC employment density by TAZ from the STDM. The STDM uses enrollment to estimate travel demand from the Scottsdale Community College.

Table 16 Base Year (2006) Employment Data

Description	Employment
Retail	2,527
Office	1,938
Industrial/Manufacturing	940
Other	1,788
Total	**7,193**

Source: City of Scottsdale Travel Demand Model, 2007; Maricopa Association of Governments, 2007.



Sources: City of Scottsdale Travel Demand Model, April 2008; Maricopa Association of Governments, 2007.

FIGURE 17 | 2006 Estimated Employment Density by TAZ

3.6 Housing Analysis

SRPMIC has a very high housing vacancy rate compared to the county and state. This figure of nearly 23 percent vacant is more often seen in communities with a high percentage of second or vacation homes. SRPMIC staff and census data indicate that this higher vacancy rate is attributable to the Shadow Mountain Village and Roadrunner Lake Resort mobile home parks that lease land from the Community. Primarily non-SRPMIC members live in the mobile home parks.

On the other hand, the home ownership rate for the SRPMIC is over 80 percent, significantly higher than the 68 percent for Maricopa County or the state as a whole. Table 17 shows a comparison of key housing statistics for SRPMIC, Maricopa County, and Arizona.

Table 17 Occupied Housing

Description	SRPMIC	Maricopa County	Arizona
Occupied Housing Units	77.6%	90.6%	86.9%
Owner-occupied Housing Units	80.4%	67.5%	68.0%
Renter-occupied Housing Units	19.6%	32.5%	32.0%
Average Household Size of Owner-occupied Units	3.04	2.74	2.69
Average Household Size of Renter-occupied Units	4.09	2.54	2.53

Source: 2000 US Census; Salt River Pima-Maricopa Indian Community General Plan Update Existing Conditions Report, September 2003.

3.7 Interim and Planning Horizon Population and Employment Projections

Table 18 shows that between the 1990 and 2000 censuses SRPMIC grew 31 percent. During the same ten-year period, Maricopa County grew over 45 percent. Generally consistent with its growth in the previous decade, Maricopa County grew nearly 20 percent between 2000 and 2005. However, the MAG Socioeconomic Projections of Population, Housing, and Employment by Municipal Planning Area and Regional Analysis Zone, May 2007, show that SRPMIC grew by only seven percent over the same five-year period. While Maricopa County continued to grow at more than 3 percent annually, the rate of growth in the SRPMIC slowed in relation to the county as a whole between 2000 and 2005.

Table 18 Historic Population Growth

Description	1990[a]		2000[b]		2005[c]	
	POP[d]	HH[e]	POP[d]	HH[e]	POP[d]	HH[e]
Maricopa County	2,122,101	807,560	3,072,366	1,132,886	3,616,690	1,352,967
SRPMIC	4,852	1,583	6,355	1,959	6,742	2,056

Source: HDR Engineering, Inc., September 2010.

Notes: a) 1990 Census Summary Tape File 1 (STF 1) 100-percent Data.
b) Census 2000 Summary File 1 (SF 1) 100-percent Data.
c) Estimate, Maricopa Association of Governments, 2007.
d) Total population in households.
e) Households.

General Plan Land Use Considerations

Although more than 83 percent of SRPMIC is open space, there is a shortage of land for new residential development. This is largely due to the allotment system of land ownership across the Community. Cooperation of multiple landowners is required to assemble a parcel large enough for a subdivision. This makes large-scale residential developments challenging. Additionally, it is difficult for Community members who are not landholders to buy and develop land in the Community.

One of the goals of the SRPMIC General Plan is to promote residential development to accommodate the housing needs of Community members. This development effort is focused on the People's Village and includes such subdivisions as "Victory Acres" and "Canalside", located south of the Arizona Canal between Country Club Drive and Mesa Drive. These subdivisions were formed from existing tribally owned lands set aside for Community purposes. With the completion of the latest Canalside subdivision, there are additional 91 parcels available for development.

While there is a shortfall of land for new residential development, the SRPMIC General Plan designates eight percent of its land area, or over 4,500 acres, for mixed-use commercial development. This is located primarily along the Pima Freeway Corridor. Currently the corridor contains two Casino Arizona locations, golf courses, and retail and commercial office development. A new convention center and hotel opened in 2010. A spring training facility is under construction and due to open in early 2011.

In addition to the new hospitality and sports developments, commercial and retail development along Pima Road is also growing. Wal-Mart is currently expanding at its location on Chaparral Road. New office buildings in Pima Center and Riverwalk are permitted or under construction.

Population Projections

Recent MAG estimates show SRPMIC population growth slowing. Between 2005 and 2030 MAG estimates that the Community will grow by 0.34 percent annually. This is well below the 2.8 percent annual growth recorded between 1990 and 2000. In large part, population growth is limited by the availability of land for residential development.

As noted earlier, the SRPMIC Housing Department is completing Canalside III and IV with 91 new home sites for Community members. It is located along the Arizona Canal in the People's Village between Mesa Drive and Country Club Drive. Build out of the Canalside home sites is assumed by 2030. The Community is also planning a multifamily village development on the northwest corner of Chaparral Drive and Dobson Road; an area shown as a high density residential development in the SRPMIC

General Plan. Build out of the multifamily village, which is anticipated to occur by 2030, will provide between 220 and 240 new residences. The Housing Department is also considering new subdivisions on Country Club Drive and Center Street between Indian School Road and Camelback Road. The size and timing of these subdivisions is unknown.

Currently, SRPMIC leases land to two mobile home parks: Shadow Mountain Village is located north of McKellips Road west of the Pima Freeway; and, the Roadrunner Lake Resort is located on 92nd Street north of McKellips Road. Residents of Shadow Mountain Village and Roadrunner Lake Resort are predominately older non-SRPMIC members. The demographics of these mobile home parks show a larger number of seasonal homes and smaller household sizes that change the picture of the SRPMIC demographics.

Census 2000 data for overall SRPMIC shows that 77 percent of housing units were occupied. Average household size was 3.24 persons per household. However, SRPMIC Housing Department officials describe long waiting lists for Community housing with high occupancy rates. Without Shadow Mountain Village and the Roadrunner Lake Resort, Census 2000 data reflects the tight demand for Community housing with occupancy rates over 95 percent. Average household size is 4.21 persons per household.

The leases for both mobile home parks are set to expire by 2030.The Shadow Mountain Village lease will expire in 2027. The Roadrunner Lake Resort lease will expire in 2019. SRPMIC plans to include the areas in its commercial and retail redevelopment plans. The eventual closure of the mobile home parks will mean a loss of population for SRPMIC because most of the mobile home park residents are not Community members. Only Community members and their families are allowed to live on SRPMIC.

The 2030 population projections for this study are based on the following:

- Full buildout and occupancy of the 331 planned new Canalside and the multifamily village residences.
- Population lost from the closure of the Roadrunner Lake Resort in 2019 will be replaced by Community members living on new home sites in allotted lands.
- Since Shadow Mountain Village will remain in place through most of this study's planning horizon, its population is included in the 2030 projections.
- Average household size estimated at traffic analysis zone (TAZ) level based on Census 2000.

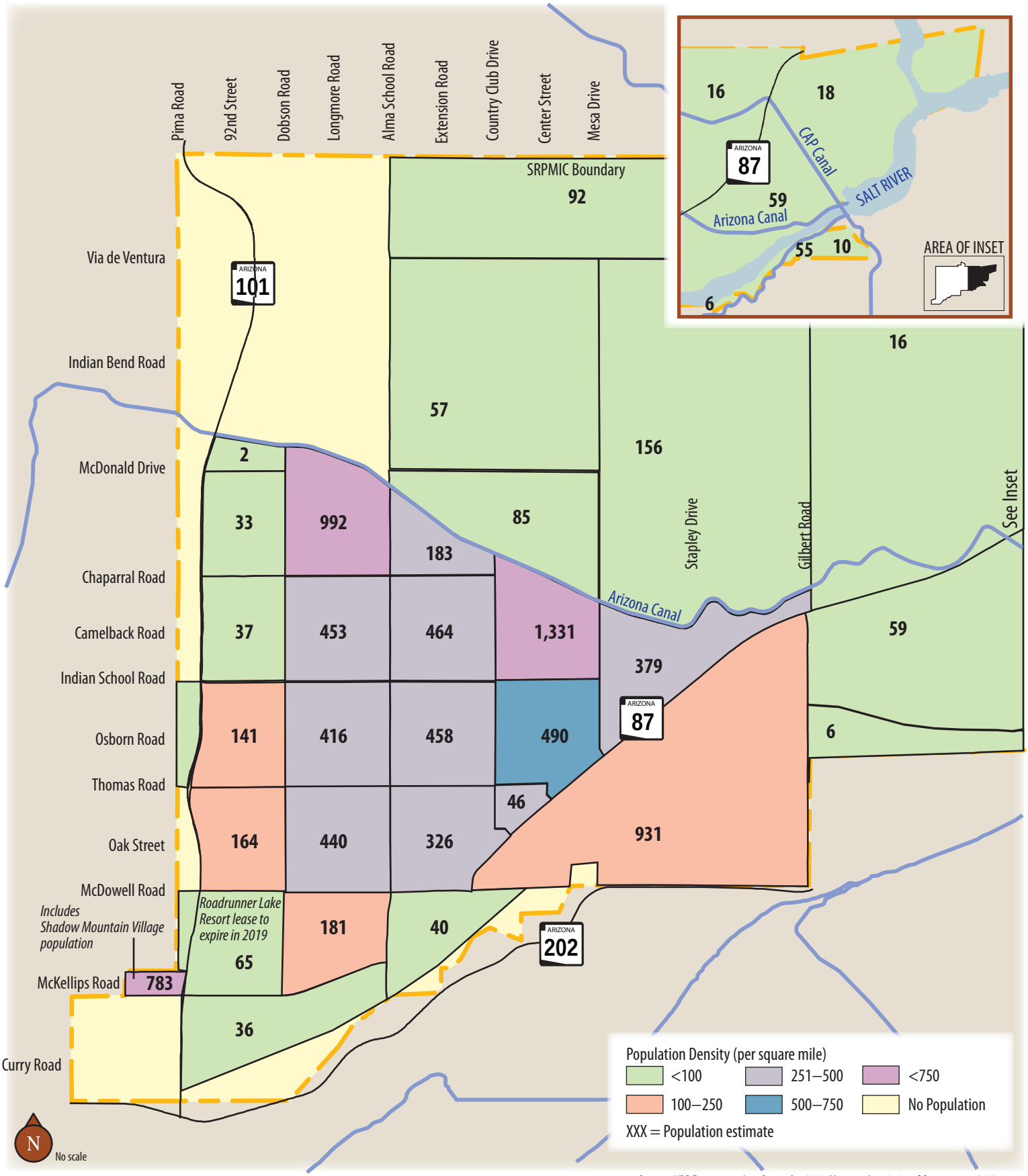
Table 19 shows the population projections. Figure 18 shows the 2030 population distribution by TAZ. The thematic map colors represent population per square mile. The labels show the population projection by TAZ. Population projections for the interim planning horizons of 2015 and 2020 are interpolated values.

Table 19 SRPMIC Population Projections

Description	Year			
	2009	2015	2020	2030[b]
Households	2,219	2,303	2,373	2,510
Population[a]	7,188	7,690	8,100	8,900

Source: HDR Engineering, September 2010.

Notes: a) Total population in households.
b) Shadow Mountain Village is included in 2030 population projections. However, Roadrunner Lake Resort is not included.



Sources: HDR Engineering, Inc., September 2010; Maricopa Association of Governments, 2007.

FIGURE 18 | 2030 Estimated Population Density by TAZ

Employment Projections

In 2008, SRPMIC completed a Planning, Impact Fees, and Fiscal Analysis (PIFFA) study. Transportation was an important component of this study. As part of this PIFFA effort, SRPMIC reviewed all developable commercial land in the Pima Freeway corridor from the northern Community boundary at 90th Street to the southern Community boundary at the Salt River. The study estimated that the development of all available commercial land in the corridor would result in 148,000 jobs. SRPMIC estimated that by 2030 over 31% of the corridor would be developed resulting in over 46,000 jobs.

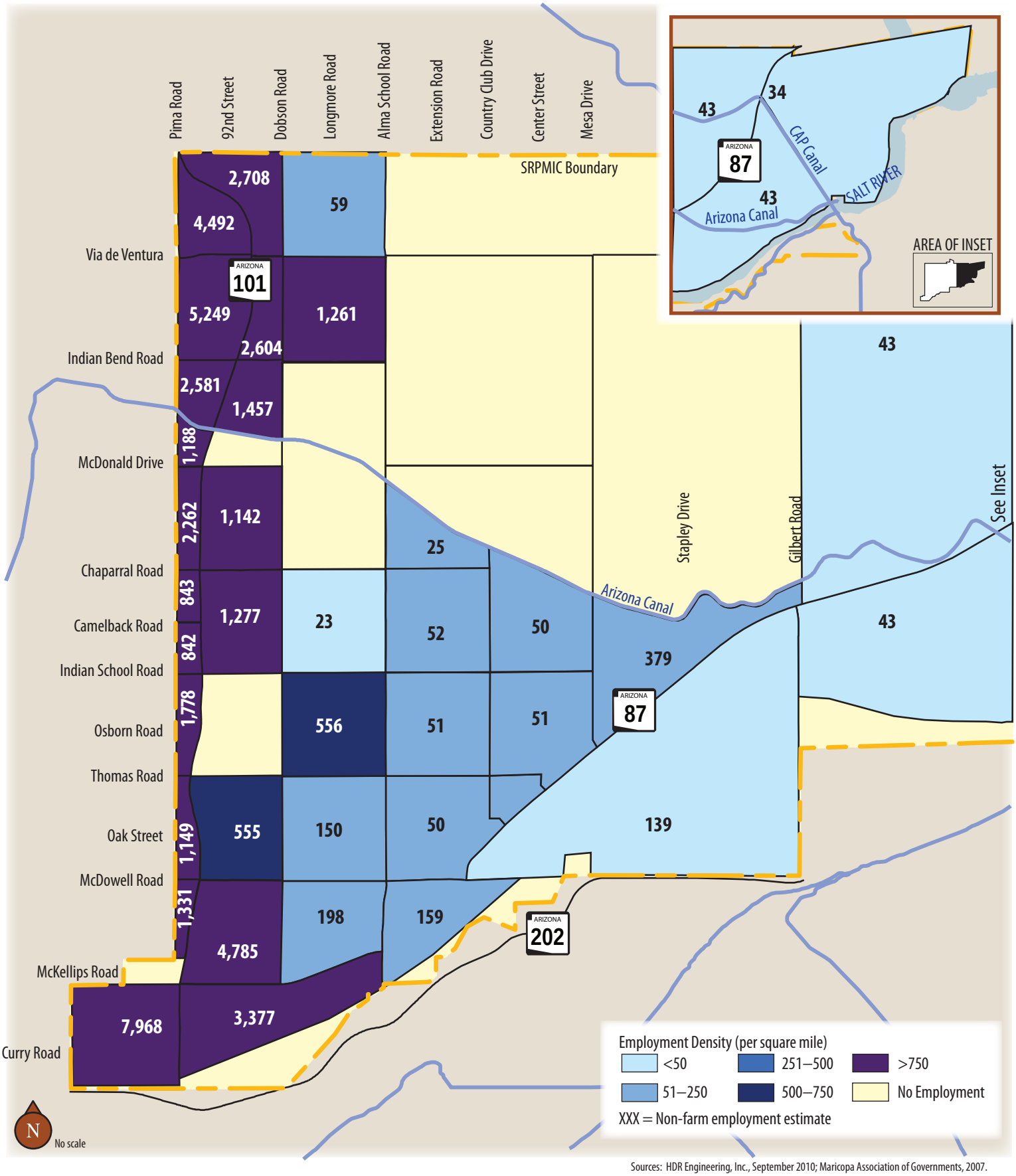
This SRPMIC employment projection for the Pima Freeway corridor is consistent with the MAG 2030 projection. HDR combined the Pima Freeway corridor estimates with MAG estimates for the remainder of the Community to prepare an overall employment projection. Table 20 shows the 2030 employment projection together with the 2006 employment estimate from the STDM. Employment projections for the interim planning horizons of 2015 and 2020 are interpolated values. Figure 19 shows the 2030 estimated employment distribution by TAZ. These estimates do not include agricultural employment. The thematic map colors represent employment per square mile. The labels show the employment estimate by TAZ.

Table 20 SRPMIC Employment Projections

Description	2006	2015	2020	2030
Retail	2,527	5,828	7,662	11,330
Office	1,938	14,509	21,493	35,460
Industrial/Manufacturing	940	1,078	1,155	1,309
Other	1,788	1,980	2,087	2,300
Total Employment	**7,193**	**23,395**	**32,397**	**50,399**

Source: HDR Engineering, Inc., September 2010; City of Scottsdale Travel Demand Model, 2007; Maricopa Association of Governments, 2007.

Appendix F includes a table showing comparative employment estimate for the Pima Freeway corridor from the PIFFA study together with a graphic showing commercial acreage.



Sources: HDR Engineering, Inc., September 2010; Maricopa Association of Governments, 2007.

FIGURE 19 | 2030 Estimated Employment Density by TAZ

Review of Growth Projections for Surrounding Communities

An additional variable for estimating future traffic on SRPMIC roads is growth in surrounding communities. Table 21 shows MAG's population and employment projections for Maricopa County and the communities surrounding SRPMIC.

Table 21 MAG Population and Employment Estimates

Area	Population[a]		CAGR 2005 to 2030[b]	Employment		CAGR 2005 to 2030[b]
	2005	2030		2005	2030	
Maricopa County	3,616,690	6,029,587	2.1%	1,747,532	3,378,800	2.7%
Fountain Hills	24,176	33,539	1.3%	7,492	11,573	1.8%
Mesa	480,246	575,481	0.7%	174,909	306,030	2.3%
Scottsdale	232,219	282,640	0.8%	181,652	252,015	1.3%
Tempe	159,056	183,388	0.6%	176,688	235,616	1.2%

Source: Maricopa Association of Governments, 2007.

Note: a) Population in households.
b) Compound Annual Growth Rate

MAG's projections show Maricopa County continuing steady population growth. However, the communities around SRPMIC are largely built out and will experience population growth at a rate well below the county average. The projections show Scottsdale adding another 50,000 people from 2005 to 2030. Tempe will add just over 24,000 residents. Much of Mesa's anticipated growth will occur in the east around the Phoenix-Mesa Gateway Airport, with less direct impact to SRPMIC. Fountain Hills is projected to add 9,000 residents over the 25-year period.

Employment growth projections for the four communities surrounding SRPMIC are also below the Maricopa County average. However, the job growth rate for each community is higher than the population growth rate. Scottsdale expects to add 70,000 new jobs, and Tempe expects to add 59,000 new jobs. Mesa will add 131,000. This means that additional traffic will be attracted into Mesa, Scottsdale, and Tempe as workers commute to fill these jobs. This regional population and employment growth may translate to more cut-through traffic traversing SRPMIC roads.

4.0 Future Transportation System Conditions

To prepare forecasts of future traffic conditions on SRPMIC, the study team utilized the 2030 STDM. Scottsdale prepared this travel demand model to support its Transportation Master Plan, which was adopted in January 2008. This model covers most of SRPMIC extending west from the SR 87 (Beeline Highway) to include the People's Village and the Pima Road corridor. The Scottsdale model includes the Red Mountain Freeway as far east as Gilbert Road.

This model has been used for several current studies in SRPMIC including the Pima Road Design Concept Report and the spring training facility traffic impact analysis. For this long range transportation plan, the study team subdivided the model's original 25 SRPMIC Traffic Analysis Zones (TAZ) into 43 TAZs to provide more detail in the traffic assignment. This refinement included adding roadways into the model to reflect the mile grid system in place on SRPMIC and connecting the system into the new TAZ layout. Roadway characteristics used in the model are based on the SRPMIC Indian Reservations Roads (IRR) database. This model refinement focused on the area north of SR 87 between Pima Road and Gilbert Road.

The study team updated this refined TAZ geography with the 2030 SRPMIC population and employment projections discussed in Section 3.7 to prepare the traffic forecasts presented here.

4.1 Planned Study Area Improvements

This section identifies the planned study area roadway capacity improvements identified from MAG, MCDOT and SRPMIC sources. Projects include road widening for additional travel lanes and new roads on new alignments. While all of these projects are planned, not all of them currently have identified funding sources. A brief discussion of each of these projects follows. The study team incorporated these improvements into the STDM to prepare a base future roadway network for the generation of initial traffic forecasts. Figure 20 shows the planned improvements together with the total number of roadway lanes.

Pima Freeway (L101), General Purpose Lanes

While design will get underway in 2013 for additional General Purpose Lanes on the Pima Freeway between Shea Boulevard and the Red Mountain Freeway, the project is not programmed for construction yet. This eventual improvement is funded by Proposition 400, Maricopa County's half-cent sales tax for transportation projects.

Red Mountain Freeway (L202), New General Purpose/HOV Lanes

The Red Mountain Freeway new General Purpose/HOV Lanes from the Pima Freeway to Gilbert Road are also identified as planned improvements in Proposition 400. This project is not programmed for construction.

Pima Road, Widen to 4 Lanes

Pima Road is a cooperative project between the SRPMIC, the City of Scottsdale, and ADOT to improve the roadway between McDowell Road and Via de Ventura. The plan calls for widening the road to 4 Lanes with a center median and bicycle lanes. Seventy percent of the funding for the project is provided through Proposition 400. Construction commenced in June 2010 from Via de Ventura to the Arizona Canal. Construction of the entire project is expected to be completed by the end of 2015.

Curry Road Extension

This project is part of the Section 12 planned commercial and industrial development for which the Community is currently preparing a master plan. Specific improvements have neither been identified nor funded; however the model incorporates a new four-lane road from McClintock Road to McKellips Road.

Salt River Bridges

Gilbert Road

MCDOT has included construction of a six-lane Gilbert Road Bridge in its five-year Transportation Improvement Program (TIP).

McKellips Road

After the Gilbert Road bridge is in place, MCDOT plans a six-lane bridge Salt River bridge crossing between Alma School Road and the Red Mountain Freeway.

Dobson Road

A Dobson Road crossing of the Salt River between the Red Mountain Freeway and McKellips Road is one of three crossings being evaluated by Maricopa County (McKellips and Gilbert are the others). The proposed four-lane bridge is not currently funded.

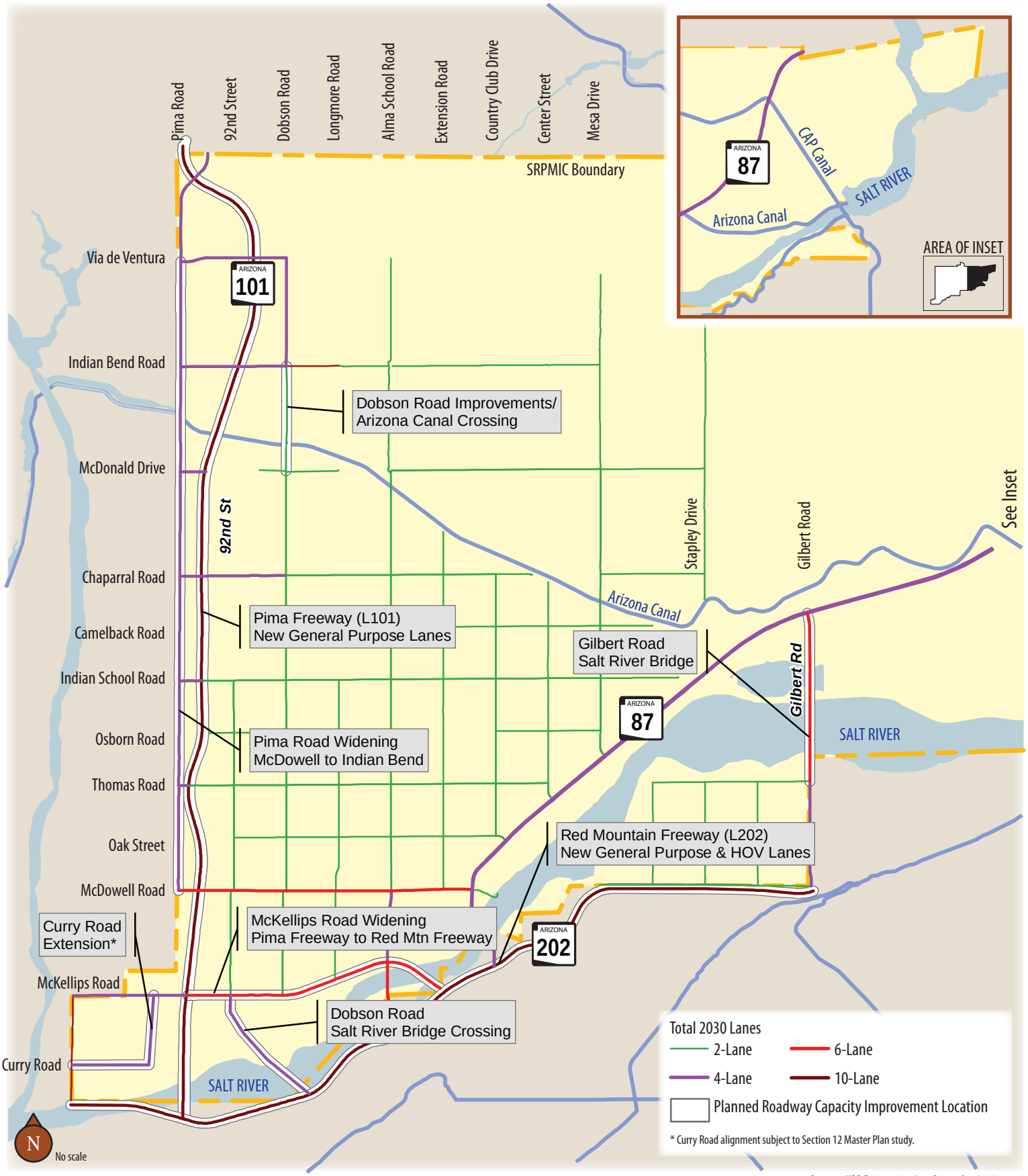
McKellips Road

MCDOT has plans to eventually widen McKellips Road between the Pima Freeway and Alma School Road from four to six lanes. Funding has not yet been identified for this improvement.

Dobson Road

The Community's Planning, Impact Fees, and Fiscal Analysis (PIFFA) Study identified a new Dobson Road crossing of the Arizona Canal. The purpose of this four-lane bridge is to connect the Talking Stick Resort area with the rest of the Community. It will also provide access to development on the east side of the Pima Freeway. Funding has not yet been identified for this improvement.

No additional new system road capacity improvements are currently funded for SRPMIC.



Sources: HDR Engineering, Inc., September 2010.

FIGURE 20 | Planned System Improvements

4.2 Traffic Assignments

The study used the 2030 Scottsdale Travel Demand Model with the updated socioeconomic projections and the planned network improvements to prepare a base future traffic forecast for SRPMIC. Table 22 shows both the current traffic counts and 2030 traffic volume estimates together with generalized segment level of service for the study area freeways. Table 23 shows both the current traffic counts and 2030 traffic volume estimates together with segment level of service for the study area arterials. Figure 21 is a graphic showing selected 2030 traffic volume estimates and segment level of service.

4.3 Network Deficiencies

The generalized level of service (LOS) analysis identified several facilities within SRPMIC that will function at LOS E or LOS F under 2030 daily traffic conditions:

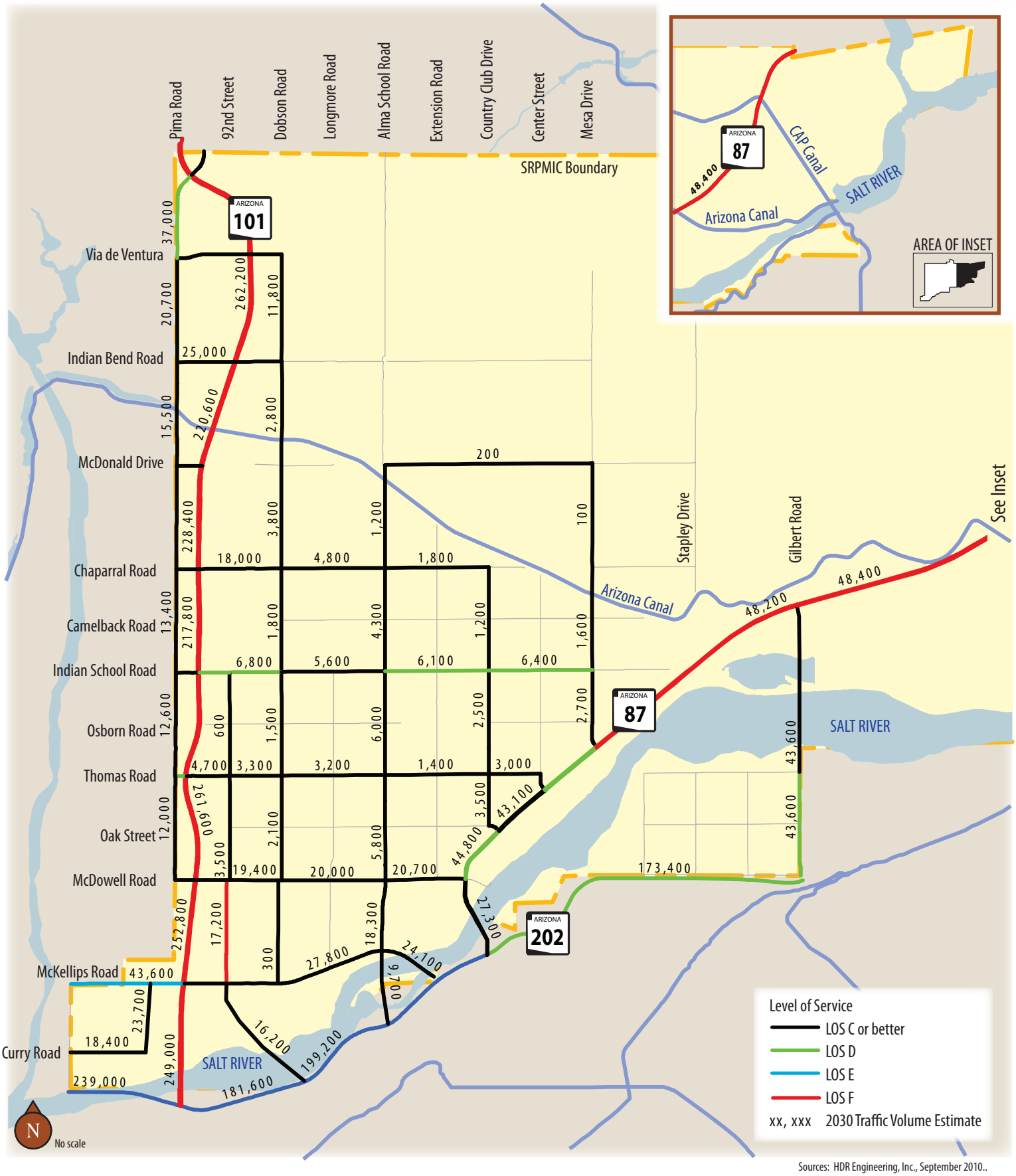
- Pima Freeway: Red Mountain Freeway to 90th Street
- Red Mountain Freeway : Scottsdale Road to Country Club Drive
- SR 87 (Beeline Highway): Mesa Drive to Shea Boulevard
- McKellips Road: Hayden Road to Pima Freeway
- 92nd Street: McKellips Road to McDowell Road

4.4 Circulation System Improvement Needs

By 2030, both the Pima Freeway and the Red Mountain Freeway will be built to their ultimate cross section of eight general purpose lanes and two High Occupancy Vehicle (HOV) lanes. Operations analysis shows that additional capacity will be needed to accommodate 2030 traffic at LOS D.

The SR 87 (Beeline Highway) shows LOS F on the segment between Mesa Drive and Shea Boulevard in 2030. A recent ADOT traffic study indicates that a traffic signal is warranted at Mesa Drive and the Beeline Highway. However, more detailed analysis of operations at the Beeline Highway and Gilbert Road intersection is needed to determine the impact of delay from the traffic signal on the increasing traffic stream. Intersection improvements may be needed in the future to improve traffic flow.

The planned new Dobson Road crossing of the Salt River will increase traffic on the two-lane section of 92nd Street between McKellips Road and McDowell Road. To maintain efficient access to Casino Arizona improvement of this section of 92nd Street to four lanes is needed concurrent with the construction of the planned bridge. This new bridge crossing is anticipated in the 2020 to 2030 horizon.



Sources: HDR Engineering, Inc., September 2010..

FIGURE 21 | Planned Improvements - 2030 Traffic Conditions

Table 22 2030 Traffic Conditions – Freeways

Roadway	From	To	2009 Lanes		Traffic Count			Current LOS	2030 Lanes		2030 Daily Volume Estimate	2030 LOS
			General Purpose	HOV	ADT	Year	Source		General Purpose	HOV		
Pima Freeway	Red Mountain Freeway	McKellips Road	6	2	170,000	2007	ADOT	F	8	2	256,000	F
Pima Freeway	McKellips Road	McDowell Road	6	2	166,000	2007	ADOT	F	8	2	262,600	F
Pima Freeway	McDowell Road	Thomas Road	6	2	177,000	2007	ADOT	F	8	2	261,600	F
Pima Freeway	Thomas Road	Indian School Road	6	2	172,000	2007	ADOT	F	8	2	250,200	F
Pima Freeway	Indian School Road	Chaparral Road	6	2	149,000	2007	ADOT	F	8	2	217,000	F
Pima Freeway	Chaparral Road	McDonald Drive	6	2	160,000	2007	ADOT	F	8	2	228,600	F
Pima Freeway	McDonald Drive	Indian Bend Road	6	2	159,000	2007	ADOT	F	8	2	221,600	F
Pima Freeway	Indian Bend Road	Via de Ventura	6	2	192,000	2007	ADOT	F	8	2	260,600	F
Pima Freeway	Via de Ventura	90th Street	6	2	165,000	2007	ADOT	F	8	2	238,000	F
Pima Freeway	90th Street	Shea Boulevard	6	2	146,000	2007	ADOT	E	8	2	215,400	F
Red Mountain Freeway	Scottsdale Road	Pima Freeway	8	2	154,000	2007	ADOT	C or better	10	2	239,000	E
Red Mountain Freeway	Pima Freeway	Dobson Road	6	-	136,000	2007	ADOT	D	8	2	181,600	E
Red Mountain Freeway	Dobson Road	Alma School Road	6	-	134,000	2007	ADOT	E	8	2	199,200	E
Red Mountain Freeway	Alma School Road	McKellips Road	6	-	127,000	2007	ADOT	D	8	2	191,000	E
Red Mountain Freeway	McKellips Road	Country Club Drive	6	-	118,000	2007	ADOT	D	8	2	191,000	E
Red Mountain Freeway	Country Club Drive	Gilbert Road	6	-	70,000	2007	ADOT	C or better	8	2	173,400	D

Source: HDR Engineering, Inc., September 2010.

Table 23 2030 Traffic Conditions - Arterials

Roadway	From	To	2009 Lanes	Traffic Count			Current LOS	2030 Lanes	2030 Daily Volume Estimate	2030 LOS
				ADT	Year	Source				
Dobson Road	McKellips Road	McDowell Road	2	262	2008	SRPMIC	C or better	2	300	B
Dobson Road	McDowell Road	Thomas Road	2	1,202	2006	SRPMIC	C or better	2	2,100	B
Dobson Road	Thomas Road	Indian School Road	2	1,202	2006	SRPMIC	C or better	2	1,500	B
Dobson Road	Indian School Road	Chaparral Road	2	1,202	2006	SRPMIC	C or better	2	1,800	B
Dobson Road	Chaparral Road	McDonald Drive	2	1,136	2006	SRPMIC	C or better	2	3,800	C
Dobson Road	McDonald Drive	Indian Bend Road	2	439	2006	SRPMIC	C or better	2	2,800	B
Dobson Road	Indian Bend Road	Via de Ventura	4	4,300	2006	SRPMIC	B	4	11,800	C
Alma School Road	Red Mountain Freeway	McKellips Road	4	11,712	2007	MCDOT	C or better	6	9,700	C
Alma School Road	McKellips Road	McDowell Road	4	10,429	2007	MCDOT	C or better	4	18,300	C
Alma School Road	McDowell Road	Thomas Road	2	3,812	2007	MCDOT	C or better	2	5,800	C
Alma School Road	Thomas Road	Indian School Road	2	3,812	2006	SRPMIC	C or better	2	6,000	C
Alma School Road	Indian School Road	Chaparral Road	2	2,212	2006	SRPMIC	C or better	2	4,300	C
Alma School Road	Chaparral Road	McDonald Drive	2	1,010	2006	SRPMIC	C or better	2	1,200	B
Country Club Drive	Oak Street	Thomas Road	2	1,316	2006	SRPMIC	C or better	2	3,500	C
Country Club Drive	Thomas Road	Indian School Road	2	971	2006	SRPMIC	C or better	2	2,500	B
Country Club Drive	Indian School Road	Chaparral Road	2	835	2006	SRPMIC	C or better	2	1,200	B
Mesa Drive	SR 87	Indian School Road	2	1,573	2006	SRPMIC	C or better	2	2,700	B
Mesa Drive	Indian School Road	Chaparral Road	2	1,573	2006	SRPMIC	C or better	2	1,600	B
Mesa Drive	Chaparral Road	McDonald Drive	2	50	2006	SRPMIC	C or better	2	100	B

Table 23 2030 Traffic Conditions – Arterials (continued)

Roadway	From	To	2009 Lanes	Traffic Count			Current LOS	2030 Lanes	2030 Daily Volume Estimate	2030 LOS
				ADT	Year	Source				
McKellips Road	Hayden Road	Pima Freeway	4	23,272	2007	MCDOT	C or better	4	43,600	E
McKellips Road	Pima Freeway	92nd Street	4	23,272	2007	MCDOT	C or better	6	45,600	C
McKellips Road	92nd Street	Dobson Road	4	23,272	2007	MCDOT	C or better	6	17,800	C
McKellips Road	Dobson Road	Alma School Road	4	23,272	2007	MCDOT	C or better	6	27,800	C
McKellips Road	Alma School Road	Red Mountain Freeway	4	15,478	2007	MCDOT	C or better	6	24,100	C
McDowell Road	Pima Road	Pima Freeway	6	-	-	-	-	6	43,900	C
McDowell Road	Pima Freeway	92nd Street	6	16,163	2007	MCDOT	C or better	6	26,700	C
McDowell Road	92nd Street	Dobson Road	6	16,163	2007	MCDOT	C or better	6	19,400	C
McDowell Road	Dobson Road	Alma School Road	6	16,163	2007	MCDOT	C or better	6	20,000	C
McDowell Road	Alma School Road	SR 87	4	16,163	2007	MCDOT	C or better	6	20,700	C
Thomas Road	Pima Road	Pima Freeway	4	21,212	2006	SRPMIC	C or better	4	33,600	D
Thomas Road	Pima Freeway	92nd Street	4	21,212	2006	SRPMIC	C or better	2	4,700	C
Thomas Road	92nd Street	Dobson Road	2	1,895	2006	SRPMIC	C or better	2	3,300	B
Thomas Road	Dobson Road	Alma School Road	2	1,895	2006	SRPMIC	C or better	2	3,200	B
Thomas Road	Alma School Road	Country Club Drive	2	698	2006	SRPMIC	C or better	2	1,400	B
Thomas Road	Country Club Drive	Center Street	2	1,504	2006	SRPMIC	C or better	2	3,000	B
Indian School Road	Pima Road	Pima Freeway	4	30,118	2006	SRPMIC	C or better	4	32,200	C
Indian School Road	Pima Freeway	92nd Street	4	30,118	2006	SRPMIC	C or better	2	6,900	D

Table 23 2030 Traffic Conditions – Arterials (continued)

Roadway	From	To	2009 Lanes	Traffic Count			Current LOS	2030 Lanes	2030 Daily Volume Estimate	203 LOS
				ADT	Year	Source				
Indian School Road	92nd Street	Dobson Road	2	3,179	2006	SRPMIC	C or better	2	6,800	D
Indian School Road	Dobson Road	Alma School Road	2	3,179	2006	SRPMIC	C or better	2	5,600	C
Indian School Road	Alma School Road	Country Club Drive	2	3,179	2006	SRPMIC	C or better	2	6,100	D
Indian School Road	Country Club Drive	Mesa Drive	2	3,179	2006	SRPMIC	C or better	2	6,400	D
Chaparral Road	Pima Road	Pima Freeway	4	17,749	2006	SRPMIC	C or better	4	30,300	C
Chaparral Road	Pima Freeway	Dobson Road	4	10,206	2006	SRPMIC	C or better	4	18,000	C
Chaparral Road	Dobson Road	Alma School Road	2	3,078	2006	SRPMIC	C or better	2	4,800	C
Chaparral Road	Alma School Road	Country Club Drive	2	1,684	2006	SRPMIC	C or better	2	1,800	B
McDonald Drive	Pima Road	Pima Freeway	4	-	-	-	-	4	28,400	C
McDonald Drive	Alma School Road	Mesa Drive	2	185	2006	SRPMIC	C or better	2	200	B
Indian Bend Road	Pima Road	Pima Freeway	4	18,710	2006	SRPMIC	C or better	4	25,000	C
Indian Bend Road	Pima Freeway	Dobson Road	4	8,628	2006	SRPMIC	C or better	4	21,400	C
Via de Ventura	Pima Road	Pima Freeway	4	12,580	2006	SRPMIC	C or better	4	18,300	C
Via de Ventura	L101	Dobson Road	4	12,580	2006	SRPMIC	C or better	4	20,100	C
SR 87	Red Mountain Freeway	McDowell Road	4	25,400	2007	ADOT	C or better	4	27,300	B
SR 87	McDowell Road	Country Club Drive	4	25,400	2007	ADOT	C or better	4	44,800	D
SR 87	Country Club Drive	Thomas Road	4	25,100	2007	ADOT	C or better	4	43,100	C
SR 87	Center Street	Mesa Drive	4	25,100	2007	ADOT	C or better	4	45,000	D
SR 87	Mesa Drive	Gilbert Road	4	25,100	2007	ADOT	C or better	4	48,200	F

Table 23 2030 Traffic Conditions – Arterials (continued)

Roadway	From	To	2009 Lanes	Traffic Count			Current LOS	2030 Lanes	2030 Daily Volume Estimate	2030 LOS
				ADT	Year	Source				
SR 87	Gilbert Road	Shea Boulevard	4	27,400	2007	ADOT	C or better	4	48,400	F
Pima Road	McDowell Road	Thomas Road	2	7,775	2007	Pima Road DCR	D	4	12,000	C
Pima Road	Thomas Road	Indian School Road	2	7,775	2007	Pima Road DCR	D	4	12,600	C
Pima Road	Indian School Road	Chaparral Road	2	7,775	2007	Pima Road DCR	D	4	13,400	C
Pima Road	Chaparral Road	McDonald Drive	2	12,454	2007	Pima Road DCR	D	4	13,400	C
Pima Road	McDonald Drive	Indian Bend Road	2	12,454	2007	Pima Road DCR	D	4	15,500	C
Pima Road	Indian Bend Road	Via de Ventura	2	12,454	2007	Pima Road DCR	D	4	20,700	C
Pima Road	Via de Ventura	Pima Freeway	4	10,517	2007	Pima Road DCR	C or better	4	37,000	D
90th Street	Pima Freeway	Via Linda	4	10,517	2007	Pima Road DCR	C or better	4	13,800	C
92nd Street	McKellips Road	McDowell Road	2	11,339	2008	SRPMIC	D	2	17,200	F
92nd Street	McDowell Road	Thomas Road	2	664	2006	SRPMIC	C or better	2	3,500	C
92nd Street	Thomas Road	Indian School Road	2	643	2006	SRPMIC	C or better	2	600	B
Gilbert Road	McDowell Road	Thomas Road	4	15,959	2007	MCDOT	C or better	4	43,600	D
Gilbert Road	Thomas Road	SR 87	4	15,959	2007	MCDOT	C or better	6	43,600	C

Source: HDR Engineering, Inc., September 2010.

4.5 Transit and Non-Motorized Transportation

There are a number of factors that indicate a demand for transit services and a non-motorized transportation system. As identified in Section 2.0, a large percentage of Community members are under 18 years of age (36 percent) and studies have found that walking rates are much higher for younger age groups than older ones. Lower household incomes are a Community concern, with the Census reporting nearly one third of the population in poverty. Lower incomes translate to households spending a greater percentage of household income on transportation. Additionally, 13 percent of households have no vehicle available (U.S. Census Bureau, 2000).

Challenges facing the Community for the development of a non-motorized transportation system are not unlike those faced by other rural communities. There is a lack of right-of-way and a lack of sidewalks. Trails are not a requirement of development and there are no existing standards requiring them and defining their appearance.

There is very little in the way of paved or un-paved trails within the SRPMIC. The rural character of the Community, characterized by its narrow roads with no curb or gutter, requires pedestrians to walk along the edge of pavement. In some cases where obstructions or canal laterals exist, pedestrians are walking on the pavement.

The few sidewalks that exist are limited to the areas of residential subdivisions within the People's Village and also within and immediately adjacent to the Two Waters Government Complex.

While the need for transit services in the Community is a separate and distinct issue, the groups that may potentially take advantage of either mode certainly overlap. The young and the old as well as those unable to drive – either due to economic, physical and/or other reasons stand to benefit from the continued operation of the Salt River Transit services.

Today, Salt River Transit provides dial-a-ride services for four routes serving the Community and outlying areas for residents traveling to Mesa, Tempe, and Scottsdale for shopping, employment, medical and social services. The service has been in operation since 1983 and provided over 22,000 passenger trips in 2008.

During the data collection phase of the project, important destinations both within the Community and beyond were identified. These include the following:

- Sycamore/Main Street Light Rail Transit Stop, Mesa
- Riverview Mall, Mesa
- Fry's Food Store 77th Street and E McDowell Road, Scottsdale
- Pavilions, Indian Bend and Pima Freeway, Scottsdale
- Scottsdale Healthcare, Scottsdale
- SRPMIC Tribal Complex
- Casino Arizona, McKellips
- Casino Arizona at Talking Stick
- Talking Stick Golf Course and Resort
- SRPMIC Recreation Complex
- Scottsdale Community College, Chaparral

In 2009, Salt River Transit will be providing special fixed route service between the Lehi Community Center and Council Chambers to facilitate Council meeting participation from members in the Lehi area. Service will operate from the Lehi Center to Two Waters and back again coinciding with the times of Council meetings.

Transit Demand

Using the Arkansas Public Transportation Needs Assessment (APTNA); populations of elderly persons age 60 and over, persons with a disability under the age of 60, and persons living in poverty under age 60 are considered transit dependent populations. Within SRPMIC an assessment of these populations indicates that as much as 60 percent of the population would be considered transit dependent.

Using the APTNA trip rates shown in Table 13 and the transit demand reported previously, Table 24 shows anticipated current and future transit demand for the SRPMIC Community through the interim and planning horizon years.

Table 24 Potential Annual Transit Demand

Year	Population	Potential Annual One-Way Passenger Trips
2009	7,188	48,377
2015	7,690	51,800
2020	8,100	54,500
2030	8,900	59,900

Source: HDR Engineering, Inc., September 2010.

While the estimated potential demand in 2009 is 116 percent greater than the passenger trips made in 2008, with no change in annual passenger trips, this difference is anticipated to increase to more than 150 percent by 2030. The greatest challenge to meeting this estimated demand, both today and in the future, will be continued funding for transit operations.

During our outreach we heard from a number of people on issues related to transit: several entities viewed increasing Community members' access to public transit positively; the need to better advertise schedules, routes and times of operation were mentioned as important to address; various stakeholders felt that it would be beneficial for SRPMIC members to be able to get to the light rail system, the study should consider public transit connections to downtown Mesa or Tempe where Community members can catch the light rail to get all over the Valley; connections to the park-and-ride lot being developed along Gilbert Road in Mesa should be evaluated; as should a connection between ASU-Tempe and North Scottsdale via SRPMIC – these connections would enable employees in the 101 Corridor to access public transportation.

Other suggestions for transit routes identified during the public outreach:

- North-south route on Alma School Road
- East-west route on Chaparral continuing beyond the Scottsdale Community College into the Community to Longmore and the Two Waters complex
- Valley Metro McDowell Route could provide a through-route, making stops and connections within the Community to Salt River Transit
- East-west connections on Thomas Road
- Mesa connections on Dobson Road, Country Club and Mesa Drive
- Improve transit service to serve the SRPMIC casinos for employment and entertainment
- Increase transit service frequency from 30 minute to 15 minute intervals

Non-Motorized Transportation

A trails system, linking schools, subdivisions and other destinations would have numerous benefits for the Community. The trails system will provide dedicated routes for bicyclists, pedestrians, and horseback riders to connect safely between activity centers. Having these safe routes may lead to increased exercise that will benefit overall Community health.

The Community has a higher prevalence of Type 2 diabetes than the general population. The National Center for Chronic Disease Prevention and Health Promotion recommends walking as the best type of physical activity to control blood sugar, weight, and blood pressure and prevent heart and blood flow problems. Walking and bicycling offer low cost, healthy alternatives to vehicular travel.

The 2006 Circulation Plan Trails system included in the SRPMIC General Plan identifies the Red Mountain Trail (i.e. Arizona Canal) as its central feature. This linear path extends across the Community from the Granite Reef Diversion Dam in the east to the Community's western border where the canal continues on into neighboring Scottsdale. The Red Mountain Trail terminates on the west at 92nd Street. A north-south trail along this alignment is shown as providing connections to Scottsdale Community College to the south and the Casino Arizona and Talking Stick Resort to the north. The Salt River Trail travels south and west through the People's Village from the Arizona Canal past the Two Waters Government Complex to Casino Arizona at McKellips and south to the Salt River. Also branching off the Red Mountain Trail is the "Lehi Trail", which connects across the Salt River to the Lehi district.

This system of trails identified in the General Plan provided the starting point to build the basic framework for the Long Range Transportation Plan's conceptual trails plan. This conceptual plan identifies additional trails that make connections with destinations identified through the stakeholder outreach.

During the public outreach, the Transportation study team heard from several different voices that the Community has no desire to provide trails linkages to the greater metropolitan area. One concern heard was that such connections will lead to non-Community members trespassing on Community land. With recognition of this concern, there are a number of projects and features immediately adjacent to the Community that bears mentioning.

Red Mountain Freeway Park and Ride

This facility is located on the northeast corner of Gilbert Road and McDowell Road. This approximately eight acre facility will include an equestrian staging area to support an equestrian trail along the east side of Gilbert Road.

Va Shly'ay Akimel Salt River Restoration Project[8]

Phase I will extend from the Pima Freeway to upstream of Alma School Road (approximately 2.5 miles from the Pima Freeway). Eventually the project will extend 14 miles between the Granite Reef Dam and the Pima Freeway. The project will include 5.1 miles of multi-use decomposed granite trails, parking lots with trailheads, rest stops and interpretative signs.

[8] *The Va Shly'ay Akimel Ecosystem Restoration Project is an ongoing, collaborative project implemented by the Salt River Pima-Maricopa Indian Community (Community), the US Army Corp of Engineers (Corps), and the City of Mesa. The Community and the City of Mesa act as project sponsors.*

Arizona Canal

The Arizona Canal is owned and managed by the Salt River Project. It is part of the larger Sun Circle Riding Trail. The canal, which essentially bisects the Community east-west, runs approximately 13 miles through the Community.

Central Arizona Project

The Central Arizona Project (CAP) canal is managed jointly by the U.S. Bureau of Reclamation and the Central Arizona Water Conservation District. The 53 miles of CAP canal system located in Maricopa County has been identified as part of the Regional Trail System. It runs diagonally across the eastern portion of the Community, exiting the Community along its northern border just west of Saddleback Mountain.

Maricopa County, together with the Bureau of Reclamation, ADOT, Phoenix, Scottsdale, Mesa and Peoria, has completed a feasibility study along its portion of the CAP canal. This study addressed locations and potential alternative alignments for a multi-use path, required additional easements, staging and trailhead access areas, neighborhood access points, wash and street crossings, and linkages to adjacent or nearby recreation areas, open spaces, and/or other trails and pathways. Sections of the trail are being constructed according to this study as development occurs adjacent to the CAP corridor.

Together the Arizona Canal and the CAP could provide bike commuter access to the employment centers in the Pima Freeway corridor.

City of Mesa

The City of Mesa's Bike and Trails Plan currently shows an unpaved canal path along the "South Canal" extending from the Granite Reef Diversion Dam. The City of Mesa is currently evaluating a potential trailhead location just south of the Granite Reef Diversion Dam providing visitors with access to Tonto National Forest land to the east.

5.0 Implementation Plan

This section of the document lays out the measures identified to maintain and enhance multimodal mobility and safety. This plan has three principal elements: roadways, transit and a non-motorized element. The recommendations for these elements are based on technical analyses of existing and future conditions as well as stakeholder and public participation.

5.1 Roads

This transportation plan addresses two types of road improvement needs for the Community: system capacity and road preservation and reconstruction. System improvements include traffic calming measures to minimize cut-through traffic and capacity improvements in the Pima Freeway corridor to provide mobility to encourage commercial development. Road preservation and reconstruction needs include pavement preservation, road reconstruction and paving gravel roads.

Table 25 shows the planned study area road capacity improvements identified from MAG, MCDOT and SRPMIC sources for each planning horizon: 2010-2015 (Near Term); 2015-2020 (Mid Term); 2020-2030 (Long Term). This table also identifies SRPMIC priority improvements. Total road capacity improvement needs identified in the SRPMIC study area for all agencies total $404 million. Some improvement needs are not included in the total because more detailed design studies are required to estimate costs. Figure 22 shows both the road capacity improvement needs and the road preservation and reconstruction needs discussed in this section.

Near-Term Priorities (2010 to 2015)

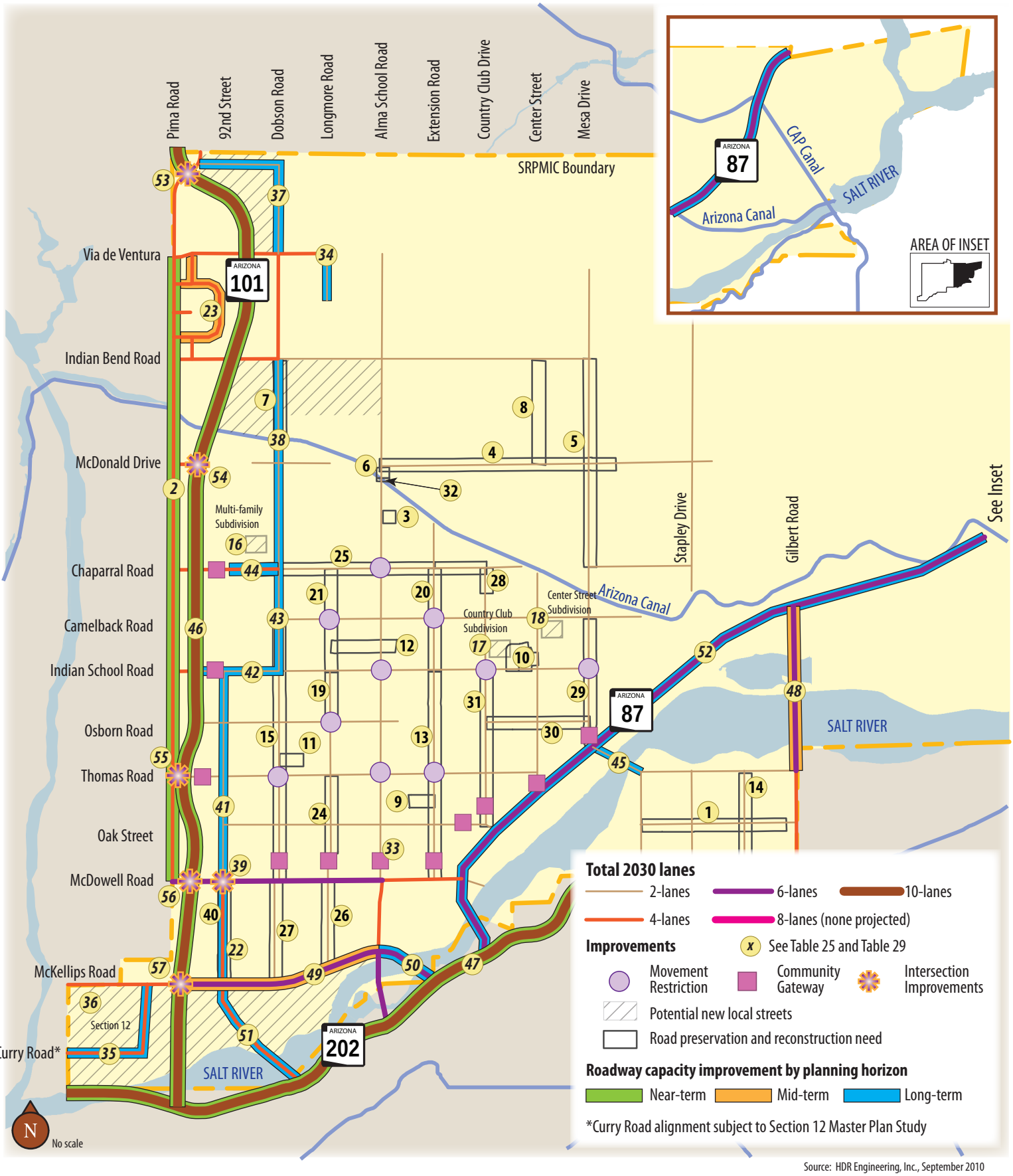
Near-term priorities are identified in the MAG or MCDOT five-year transportation improvement program and the SRPMIC Tribal Transportation Improvement Program (TTIP). Funding has been identified for these improvements and construction is planned. This section also includes near-term recommendations identified by this study for safety or operational improvements.

Operational and Safety Improvements

Based on the Community outreach, this study supports the recommendations of the RME cut-through traffic study to begin developing an effective strategy to minimize cut-through commuter traffic. As part of these traffic calming measures, the Community should consider recessed pavement markers along lane markings and rumble strips at the road edge lines to maintain driver attention and improve safety.

For near term safety purposes, it is recommended that a raised median be installed on Chaparral Road between Pima Road and the Pima Freeway. This is a high crash location with conflicts between vehicles traveling east on Chaparral Road and westbound vehicles turning left into the Wal-Mart parking lot.

At all Pima Freeway traffic interchanges, flexible reflective delineators and lighted flexible bollard signs should be considered along painted island curbs at tight left turn movements to obtain driver attention. These flexible signs recover from vehicle impacts and are highly visible. Specifically at the Thomas Road-Pima Road and Thomas Road-Pima Freeway traffic interchanges, optically programmed signal heads should be considered to improve operations and safety for eastbound and westbound traffic.



Source: HDR Engineering, Inc., September 2010

FIGURE 22 | Road Improvement Needs

Table 25 Road Capacity Improvement Needs

SRPMIC Priority	Road	From	To	Description	Jurisdiction	Cost Estimate (Thousands)
Near Term (2010 to 2015)						
2	Pima Road	McDowell Road	Via de Ventura	Widen to 4 lanes	SRPMIC/ City of Scottsdale	$70,400
16	Multi-family Village Roads	Within subdivision		New local residential streets	SRPMIC	-[a]
17	Country Club Subdivision Roads	Within subdivision		New local residential streets	SRPMIC	-[a]
18	Center Street Subdivision Roads	Within subdivision		New local residential streets	SRPMIC	-[a]
46	Pima Freeway	Red Mountain Freeway	Shea Boulevard	New general purpose lanes	ADOT	$97,400
47	Red Mountain Freeway	Pima Freeway	Gilbert Road	New general purpose lanes	ADOT	$60,300
Mid Term (2016 to 2020)						
23	Spring Training Facility Roads			Widen to 4 lanes	SRPMIC	-[a]
48	Gilbert Road	Thomas Road	SR 87 (Beeline Highway)	6-lane bridge	MCDOT	$32,970
49	McKellips Road	Pima Freeway	Alma School Road	Widen to 6 lanes	MCDOT	$14,750
Long Term (2021 to 2030)						
33	Traffic calming measures at various locations			Entry treatments and traffic channelization.	SRPMIC	-[a]
34	Longmore Road	Talking Sticks	Via de Ventura	New 2 lane	SRPMIC	$1,000
35	Curry Road Extension	McClintock Road	McKellips Road	New 4 lane	SRPMIC	$4,800
36	Section 12 Infrastructure Roads				SRPMIC	-[a]

Table 25 Road Capacity Improvement Needs (continued)

SRPMIC Priority	Road	From	To	Description	Jurisdiction	Cost Estimate (Thousands)
37	Dobson Road	Via de Ventura	90th Street	New 3 lane	SRPMIC	$3,750
38	Dobson Road	Arizona Canal Bridge	New 4-lane canal crossing		SRPMIC	$682
39	92nd Street and McDowell Road Intersection Improvements			Remove offset and align 92nd Street	SRPMIC/ MCDOT	$500
40	92nd Street	McKellips Road	McDowell Road	Widen to 4 lanes	SRPMIC	$4,000
41	92nd Street	McDowell Road	Indian School Road	Widen to 3 lanes	SRPMIC	$6,000
42	Indian School Road	Pima Freeway	Dobson Road	Widen to 3 lanes	SRPMIC	$2,400
43	Dobson Road	Indian School Road	McDonald Drive	Widen to 3 lanes	SRPMIC	$6,000
44	Chaparral Road	92nd Street	Dobson Road	Widen to 4 lanes	SRPMIC/ MCDOT	$2,000
45	Lehi Crossing			New Salt River crossing	SRPMIC	$600
50	McKellips Road Bridge			New 6 lane bridge	MCDOT	$24,725
51	Dobson Road	Red Mountain Freeway	McKellips Road	New 4 lane bridge	MCDOT	$47,700
52	SR 87	Red Mountain Freeway	Shea Boulevard	Widen to 6 lanes	ADOT	$24,000
53	Pima Freeway and Pima Road/90th Street Traffic Interchange			Additional through and turn lanes	ADOT	-[a]
54	Pima Freeway and McDonald Drive Traffic Interchange			Additional through and turn lanes	ADOT	-[a]
55	Pima Freeway and Thomas Road Traffic Interchange			Additional through and turn lanes	ADOT	-[a]
56	Pima Freeway and McDowell Road Traffic Interchange			Additional through and turn lanes	ADOT	-[a]
57	Pima Freeway and McKellips Road Traffic Interchange			Additional through and turn lanes	ADOT	-[a]

Sources: MAG Regional Transportation Plan 2010 Update, June 2010; Maricopa Department of Transportation FY 2011-2015 Transportation Improvement Program, June 21, 2010; HDR Engineering, Inc., September 2010.

Notes: a) More detailed study needed to determine improvement cost.

ADOT

The MAG draft Fiscal Year 2011-2015 Transportation Improvement Plan shows that the ADOT will add new general purpose lanes on both the Pima Freeway and the Red Mountain Freeway . The Pima Freeway will have four general purpose lanes and a HOV lane in each direction between the Red Mountain Freeway and Shea Boulevard. The Red Mountain Freeway will have four general purpose lanes and a HOV lane in each direction between the Pima Freeway and Gilbert Road.

With the construction of the additional general purpose lanes, the Pima Freeway and the Red Mountain Freeway will have reached the number of lanes shown in the MAG 2010 Update of the Regional Transportation Plan (RTP). The MAG RTP does not show any additional improvements to ADOT roads within the SRPMIC study area through its Fiscal Year 2031 planning horizon.

MCDOT

In the near term, the MCDOT is setting aside funds for right-of-way acquisition, design, and construction of three Salt River bridges: Gilbert Road, Dobson Road, and McKellips Road. MCDOT is also studying the widening of McKellips Road from the Pima Freeway to the Salt River from two lanes in each direction to three lanes in each direction.

SRPMIC

SRPMIC and the City of Scottsdale are partnering on the widening of Pima Road to two lanes in each direction from McDowell Road to Via de Ventura. This improvement is anticipated by 2015.

New subdivision roads are planned to support development in the Multi-family Village, Country Club subdivision, and Center Street subdivision.

Mid-Term Priorities (2016 to 2020)

Mid-term priorities will be added to the five-year transportation improvement programs during the next cycle of updates.

MCDOT

The Gilbert Road Bridge is the MCDOT's first improvement priority. The next priority is the widening of McKellips Road between the Pima Freeway and Alma School Road.

SRPMIC

In this mid-term planning horizon, SRPMIC anticipates widening the Spring Training Facility internal circulation roads to two travel lanes in each direction.

Long-Term Priorities (2021 to 2030)

Long-term priorities are planned improvements that have not yet been identified for funding but are next on the priority list.

ADOT

Although the MAG RTP does not show any additional improvements within SRPMIC through FY2031, ADOT is encouraged to begin planning for widening SR 87 and other traffic interchange improvements along Pima Freeway.

MCDOT

Through the long-term horizon, MCDOT is planning new bridge crossings of the Salt River at McKellips Road and Dobson Road.

SRPMIC

Traffic Calming Measures

In 2009, the SRPMIC Tribal Council commissioned Red Mountain Engineering, LLC, (RME) to prepare recommendations to reduce cut-through traffic within the Community. The RME study *Mitigating Cut-Through Traffic on Salt River Pima-Maricopa Indian Community Roads* (December 2009), identifies potential traffic calming measures that range from mild to severe depending on how traffic circulation is affected.

The first element recommended by the RME study is a Community Gateway Assembly that combines new signs and pavement treatments to alert drivers and slow traffic down ahead of a reduced speed zone. The second element of the study's recommendation is using closures and physical turn restrictions in conjunction with the SRPMIC Police and Fire Departments, Education Department, and Public Works Department to develop a traffic channelization plan. The goal of these measures is to disrupt existing cut-through traffic patterns and increase total travel times between the major Community access points. SRPMIC plans to implement traffic calming measures to minimize cut-through traffic over the long-term.

92nd Street/Dobson Road

By 2030, the Community plans to upgrade the 92nd Street/Dobson Road corridor to arterial status. This corridor is the preferred alternative identified in the SRPMIC PIFFA Study. This improvement would provide north-south access to the casinos, the Scottsdale Community College and commercial development from McKellips Road on the south to 90th Street on the north.

Between McKellips and McDowell Road, this corridor would have 110-foot right-of-way with two travel lanes in each direction. It includes a 16-foot landscaped median with an 8-foot sidewalk and 10-foot multi-use path. At McDowell Road, the existing east-west offset of 92nd Street would require realignment. Between McDowell Road and Indian Bend Road, the corridor would be built on 80-foot right-of-way with one travel lane in each direction with a center two-way left turn lane. It would include an 8-foot wide detached sidewalk with a 6-foot landscape buffer.

A new crossing of the Arizona Canal would be also required at Dobson Road between McDonald Drive and Indian Bend Road. Dobson Road exists as a four-lane facility between Indian Bend Road and Via de Ventura. Between Via de Ventura and 90th Street, Dobson Road would be constructed as three-lane cross section on an 80-foot right-of-way through the Windstone Development.

Section 12

In the Section 12 area south of McKellips Road and west of the Pima Freeway, the Community will construct infrastructure necessary for access to commercial development. The Community is currently preparing a master plan for this area.

Other Improvements

The Community also plans to extend Longmore Road from its terminus within the Talking Sticks Golf Resort north to Via de Ventura as a new road with one lane in each direction. The Lehi Crossing of the Salt River is another long term Community priority. Chaparral Road is planned for widening to two lanes in each direction between 92nd Street and Dobson Road.

System Performance

The study team incorporated these near-, mid-, and long-term road improvements into the 2030 City of Scottsdale Travel Demand Model to evaluate system performance under projected future conditions. This includes improvements to the Pima Freeway, the Red Mountain Freeway and SR 87. To simulate the effects of the traffic calming measures, the study team assumed that overall travel speed on interior SRPMIC roads would decrease by one-third. For example a 30 mph road would be reduced to a 20 mph road.

Table 26 and Table 27 show segment level of service and 2030 traffic volume estimates for study area roads. These tables include the traffic volume estimates from the base future scenario shown in Figure 21. Also shown are traffic volume forecasts and segment level of service for the recommended traffic calming and improvements to the 92nd Street/Dobson Road corridor. Figure 23 is a graphic showing selected 2030 traffic volume estimates and segment level of service for the study area with the recommended improvements.

The travel demand model results suggest that the traffic calming measures will significantly reduce the volume of cut-through commuter traffic on interior Community roads. Table 27 shows significantly lower volumes on such facilities as Alma School Road, Thomas Road, Country Club Drive and Chaparral Road. With cut-through traffic rerouted, there is a corresponding increase of traffic on SR 87. The traffic forecasts suggest that reducing SRPMIC cut-through traffic will cause traffic operations on SR 87 to deteriorate to LOS F by 2030. Traffic increases on the 92nd Street /Dobson Road corridor, with forecast traffic operations estimated at LOS C or better.

Intersection Performance

Using the 2030 traffic forecasts from the recommended scenario, the study team developed AM and PM peak hour traffic volume estimates for the 34 study intersections in the Pima Freeway Corridor. The study team updated the SYNCHRO model with these 2030 traffic forecasts to provide information about the need for installing new traffic signals and intersection improvements needed to accommodate future travel demand.

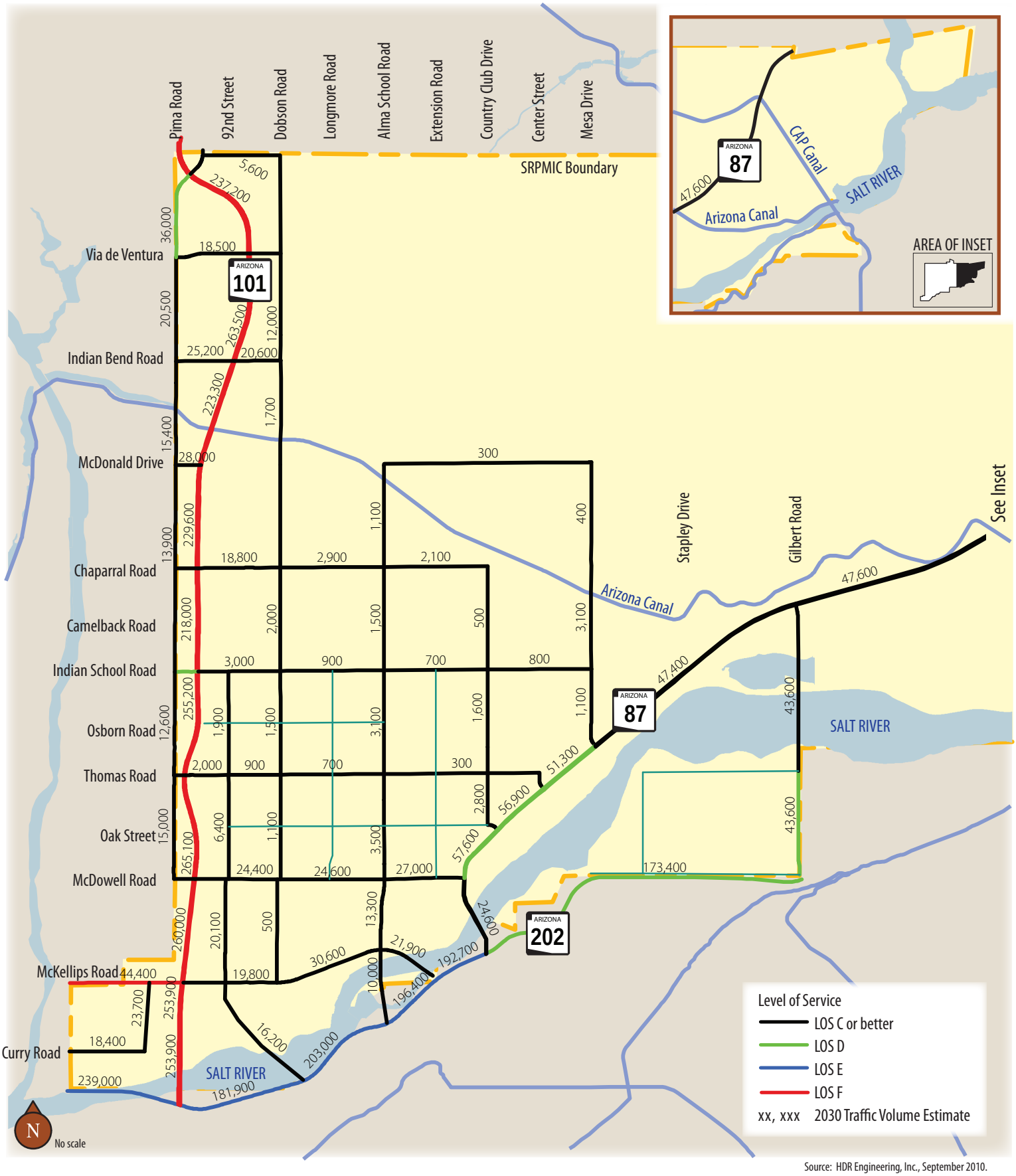
The intersection lane configurations on Pima Road from McDowell Road to Via De Ventura were assumed to be built out as recommended in July 2009 *Pima Road Design Concept Report*. All other intersection lane configurations were based on 2009 conditions. Appendix G shows the intersection lane configurations, peak hour traffic volume estimates, and AM and PM intersection level of service.

This analysis shows that under 2030 traffic conditions, the following freeway traffic intersections will operate at LOS E or worse:

- Pima Freeway and 90th Street
- Pima Freeway and McDonald Drive
- Pima Freeway and Thomas Road
- Pima Freeway and McDowell Road
- Pima Freeway and McKellips Road

More study is required to identify appropriate actions to improve the operations of these freeway traffic intersections. Adding additional lanes or changing interchange configuration would likely require significant reconstruction of the interchange itself. The proximity of Pima Road also contributes to traffic operations deficiencies at several of these locations.

The other Pima Freeway corridor location that is forecast to operate at LOS E or worse is the 90th Street and Via Linda intersection. This intersection is outside SRPMIC in the City of Scottsdale. The SYNCHRO analysis suggests that additional turn lanes would be required by 2030 to accommodate forecast travel demand.



Source: HDR Engineering, Inc., September 2010.

FIGURE 23 | Recommended Improvements - 2030 Traffic Conditions

Table 26 Recommended Improvements – 2030 Freeway Traffic Conditions

Road	From	To	2030 Lanes		Base Future		Recommended	
			General Purpose	HOV	2030 Daily Volume Estimate	2030 LOS	2030 Daily Volume Estimate	2030 LOS
Pima Freeway	Red Mountain Freeway	McKellips Road	8	2	256,000	F	253,900	F
Pima Freeway	McKellips Road	McDowell Road	8	2	262,600	F	260,000	F
Pima Freeway	McDowell Road	Thomas Road	8	2	261,600	F	265,100	F
Pima Freeway	Thomas Road	Indian School Road	8	2	250,200	F	255,200	F
Pima Freeway	Indian School Road	Chaparral Road	8	2	217,000	F	218,000	F
Pima Freeway	Chaparral Road	McDonald Drive	8	2	228,600	F	229,600	F
Pima Freeway	McDonald Drive	Indian Bend Road	8	2	221,600	F	223,300	F
Pima Freeway	Indian Bend Road	Via de Ventura	8	2	260,600	F	263,500	F
Pima Freeway	Via de Ventura	90th Street	8	2	238,000	F	237,200	F
Pima Freeway	90th Street	Shea Boulevard	8	2	215,400	F	215,500	F
Red Mountain Freeway	Scottsdale Road	Pima Freeway	10	2	239,000	E	239,000	E
Red Mountain Freeway	Pima Freeway	Dobson Road	8	2	181,600	E	181,900	E
Red Mountain Freeway	Dobson Road	Alma School Road	8	2	199,200	E	203,000	E
Red Mountain Freeway	Alma School Road	McKellips Road	8	2	191,000	E	196,400	E
Red Mountain Freeway	McKellips Road	Country Club Drive	8	2	191,000	E	192,700	E
Red Mountain Freeway	Country Club Drive	Gilbert Road	8	2	173,400	D	173,400	D

Source: HDR Engineering, Inc., September 2010.

Table 27 Recommended Improvements – 2030 Arterial Traffic Conditions

Road	From	To	Base Future			Recommended		
			Lanes	Daily Volume Estimate	LOS	Lanes	Daily Volume Estimate	LOS
Dobson Road	Red Mountain Freeway	McKellips Road	4	16,200	C	4	16,200	C
Dobson Road	McKellips Road	McDowell Road	2	300	C	2[a]	500	C
Dobson Road	McDowell Road	Thomas Road	2	2,100	C	2[a]	1,100	C
Dobson Road	Thomas Road	Indian School Road	2	1,500	C	2[a]	1,500	C
Dobson Road	Indian School Road	Chaparral Road	2	1,800	C	2[a]	2,000	C
Dobson Road	Chaparral Road	McDonald Drive	2	3,800	C	2[a]	2,900	C
Dobson Road	McDonald Drive	Indian Bend Road	2	2,800	C	2[a]	1,700	C
Dobson Road	Indian Bend Road	Via de Ventura	4	11,800	C	4	12,000	C
Dobson Road	Via de Ventura	90th Street	-	-	-	2[a]	5,600	C
Alma School Road	Red Mountain Freeway	McKellips Road	4	9,700	C	6	10,000	C
Alma School Road	McKellips Road	McDowell Road	4	18,300	C	4	13,300	C
Alma School Road	McDowell Road	Thomas Road	2	5,800	C	2	3,500	C
Alma School Road	Thomas Road	Indian School Road	2	6,000	C	2	3,100	C
Alma School Road	Indian School Road	Chaparral Road	2	4,300	C	2	1,500	C
Alma School Road	Chaparral Road	McDonald Drive	2	1,200	C	2	1,100	C
Country Club Drive	Oak Street	Thomas Road	2	3,500	C	2	2,800	C
Country Club Drive	Thomas Road	Indian School Road	2	2,500	C	2	1,600	C
Country Club Drive	Indian School Road	Chaparral Road	2	1,200	C	2	500	C
Mesa Drive	SR 87	Indian School Road	2	2,700	C	2	1,100	C
Mesa Drive	Indian School Road	Chaparral Road	2	1,600	C	2	3,100	C
Mesa Drive	Chaparral Road	McDonald Drive	2	100	C	2	400	C
McKellips Road	Hayden Road	Pima Freeway	4	43,600	E	4	44,400	E
McKellips Road	Pima Freeway	92nd Street	6	45,600	C	6	46,900	C
McKellips Road	92nd Street	Dobson Road	6	17,800	C	6	19,800	C
McKellips Road	Dobson Road	Alma School Road	6	27,800	C	6	30,600	C

Table 27 Recommended Improvements – 2030 Arterial Traffic Conditions (continued)

Road	From	To	Base Future			Recommended		
			2030 Lanes	Daily Volume Estimate	LOS	Lanes	Daily Volume Estimate	LOS
McKellips Road	Alma School Road	Red Mountain Freeway	6	24,100	C	6	21,900	C
McDowell Road	Pima Road	Pima Freeway	6	43,900	C	6	44,300	C
McDowell Road	Pima Freeway	92nd Street	6	26,700	C	6	32,900	C
McDowell Road	92nd Street	Dobson Road	6	19,400	C	6	24,400	C
McDowell Road	Dobson Road	Alma School Road	6	20,000	C	6	24,600	C
McDowell Road	Alma School Road	SR 87	6	20,700	C	4	27,000	C
Thomas Road	Pima Road	Pima Freeway	4	33,600	D	4	32,300	D
Thomas Road	Pima Freeway	92nd Street	2	4,700	C	2	2,000	C
Thomas Road	92nd Street	Dobson Road	2	3,300	C	2	900	C
Thomas Road	Dobson Road	Alma School Road	2	3,200	C	2	700	C
Thomas Road	Alma School Road	Country Club Drive	2	1,400	C	2	300	C
Thomas Road	Country Club Drive	Center Street	2	3,000	C	2	300	C
Indian School Road	Pima Road	Pima Freeway	4	32,200	C	4	33,100	D
Indian School Road	Pima Freeway	92nd Street	2	6,900	D	2	3,000	C
Indian School Road	92nd Street	Dobson Road	2	6,800	D	2	3,000	C
Indian School Road	Dobson Road	Alma School Road	2	5,600	C	2	900	C
Indian School Road	Alma School Road	Country Club Drive	2	6,100	D	2	700	C
Indian School Road	Country Club Drive	Mesa Drive	2	6,400	D	2	800	C
Chaparral Road	Pima Road	Pima Freeway	4	30,300	C	4	30,600	C
Chaparral Road	Pima Freeway	Dobson Road	4	18,000	C	4	18,800	C
Chaparral Road	Dobson Road	Alma School Road	2	4,800	C	2	2,900	C
Chaparral Road	Alma School Road	Country Club Drive	2	1,800	C	2	2,100	C
McDonald Drive	Pima Road	Pima Freeway	4	28,400	C	4	28,000	C
McDonald Drive	Alma School Road	Mesa Drive	2	200	C	2	300	C

Table 27 Recommended Improvements – 2030 Arterial Traffic Conditions (continued)

Road	From	To	Base Future			Recommended		
			Lanes	Daily Volume Estimate	LOS	Lanes	Daily Volume Estimate	LOS
Indian Bend Road	Pima Road	Pima Freeway	4	25,000	C	4	25,200	C
Indian Bend Road	Pima Freeway	Dobson Road	4	21,400	C	4	20,600	C
Via de Ventura	Pima Road	Pima Freeway	4	18,300	C	4	18,500	C
Via de Ventura	Pima Freeway	Dobson Road	4	20,100	C	4	22,100	C
SR 87	Red Mountain Freeway	McDowell Road	4	27,300	C	6	24,600	C
SR 87	McDowell Road	Country Club Drive	4	44,800	D	6	57,600	D
SR 87	Country Club Drive	Thomas Road	4	43,100	C	6	56,900	D
SR 87	Center Street	Mesa Drive	4	45,000	D	6	51,300	D
SR 87	Mesa Drive	Gilbert Road	4	48,200	F	6	47,400	C
SR 87	Gilbert Road	Shea Boulevard	4	48,400	F	6	47,400	C
Pima Road	McDowell Road	Thomas Road	4	12,000	C	4	1,700	B
Pima Road	Thomas Road	Indian School Road	4	12,600	C	4	12,600	C
Pima Road	Indian School Road	Chaparral Road	4	13,400	C	4	13,900	C
Pima Road	Chaparral Road	McDonald Drive	4	13,400	C	4	13,900	C
Pima Road	McDonald Drive	Indian Bend Road	4	15,500	C	4	15,400	C
Pima Road	Indian Bend Road	Via de Ventura	4	20,700	C	4	20,500	C
Pima Road	Via de Ventura	Pima Freeway	4	37,000	D	4	36,000	D
90th Street	Pima Freeway	Via Linda	4	13,800	C	4	13,200	C
92nd Street	McKellips Road	McDowell Road	2	17,200	F	4	20,100	C
92nd Street	McDowell Road	Thomas Road	2	3,500	C	2[a]	6,400	D
92nd Street	Thomas Road	Indian School Road	2	600	B	2[a]	1,900	C
Gilbert Road	McDowell Road	Thomas Road	4	43,600	D	4	43,600	D
Gilbert Road	Thomas Road	SR 87	6	43,600	C	6	43,600	C

Source: HDR Engineering, Inc., September 2010.

Notes: a) One lane in each direction with a center two-way left turn lane.

Table 28 Pima Freeway Corridor Study Intersections Level of Service Summary

ID	Intersection Name	Traffic Control[a]	AM Peak		PM Peak	
			LOS[b]	Delay (sec)	LOS[b]	Delay (sec)
1	Pima Road and Via De Ventura	Signal	D	47.8	D	46.5
2	Pima Road and Indian Bend Road	Signal	C	22.2	C	28.4
3	Pima Road and McDonald Drive	Signal	C	27.4	C	27.0
4	Pima Road and Chaparral Road	Signal	C	34.1	C	34.5
5	Pima Road and Indian School Road	Signal	D	35.6	D	48.6
6	Pima Road and Thomas Road	Signal	D	47.8	E	64.0
7	Pima Road and McDowell Road	Signal	C	26.1	C	23.3
8	Pima Freeway and Pima Road/90st Street	Signal	F	101.4	F	100.9
9	Pima Freeway and Via De Ventura SB Ramp	Signal	C	22.4	C	24.4
10	Pima Freeway and Via De Ventura NB Ramp	Signal	C	33.2	C	28.8
11	Pima Freeway and Indian Bend Road SB Ramp	Signal	C	21.3	C	32.0
12	Pima Freeway and Indian Bend Road NB Ramp	Signal	C	21.3	C	21.7
13	Pima Freeway and McDonald Drive SB Ramp	Signal	C	31.4	E	68.1
14	Pima Freeway and McDonald Drive NB Ramp	Signal	C	31.7	E	65.0
15	Pima Freeway and Chaparral Road SB Ramp	Signal	D	36.7	D	42.2
16	Pima Freeway and Chaparral Road NB Ramp	Signal	C	21.6	C	20.5
17	Pima Freeway and Indian School Road SB Ramp	Signal	C	28.8	C	30.2
18	Pima Freeway and Indian School Road NB Ramp	Signal	C	22.8	C	20.6
19	Pima Freeway and Thomas Road SB Ramp	Signal	D	38.7	D	44.5
20	Pima Freeway and Thomas Road NB Ramp	Signal	F	103.4	E	60.1
21	Pima Freeway and McDowell Road SB Ramp	Signal	E	57.5	D	49.9
22	Pima Freeway and McDowell Road NB Ramp	Signal	E	61.3	E	70.3
23	Pima Freeway and McKellips Road SB Ramp	Signal	E	76.9	F	83.0
24	Pima Freeway and McKellips Road NB Ramp	Signal	E	59.8	E	56.7
25	92nd Street and Chaparral Road	Signal	A	3.9	A	4.4
26	92nd Street and Indian School Road	AWSC	A	8.2	B	8.2
27	92nd Street and Thomas Road	AWSC	A	9.2	A	9.3
28	92nd Street and McDowell Road	Signal	C	31.0	C	24.9
29	92nd Street and McKellips Road	Signal	D	38.4	D	34.4
30	Dobson Road and Via De Ventura	AWSC	E	28.2	C	16.4
31	Dobson Road and Indian Bend Road	AWSC	B	13.1	B	13.9
32	Dobson Road and McDonald Drive	AWSC	A	7.6	A	8.6
33	Dobson Road and Chaparral Road	AWSC	C	15.6	B	12.7
34	90th Street and Via Linda Road	Signal	F	95.4	E	76.4

Source: HDR Engineering, Inc., September 2010.

Notes: a) AWSC - All Way Stop Control; b) Level of service for signalized intersections based on average control delay per vehicle, according to the Highway Capacity Manual, Transportation Research Board, 2000.

Road Preservation and Reconstruction Needs

This transportation plan also identifies road preservation and reconstruction needs to satisfy the BIA Indian Reservation Roads Program requirements. Road preservation is necessary to protect the Community's investment in its transportation infrastructure. It includes pavement rehabilitation, pavement overlays, road reconstruction and paving high volume gravel roads. Figure 22 shows the Community's road preservation and reconstruction needs. Table 29 provides a description of each project and the SRPMIC priority. Planning level cost estimates are included in the table. Identified road preservation and reconstruction needs are $33.3 million.

Other road construction plans include using federal Congestion Management and Air Quality (CMAQ) funds to pave high traffic volume dirt roads. Roads slated for paving include portions of Dobson Road, Center Street, McDonald Road, and Alma School Road.

Table 29 Road Preservation and Reconstruction Needs

SRPMIC Priority	Route	Section	Roadway	Description	Condition	Average Daily Traffic	Length (miles)		Route Owner	Cost Estimate (Thousands)
							Paved	Gravel		
1	32	30	Oak Street: Horne Road to Gilbert Road	Reconstruction	2.2	779	1.6		SRPMIC	$3,200
3	20	20	Jackrabbit Road: Alma School Road to Beverly Street	Reconstruction	0.5	50	0.1		SRPMIC	$200
4	18	10	McDonald Drive: Alma School Road to Mesa Drive	New construction	1.9	185		2.0	SRPMIC	$4,000
		20	McDonald Drive: Mesa Drive to Olive Street		1.7	50		0.3	SRPMIC	$600
5	19	20	Mesa Drive: Chaparral Road to McDonald Drive	New construction	1.7	50		1.0	SRPMIC	$2,000
		25	Mesa Drive: McDonald Drive to Indian Bend Road		1.4	50		1.0	SRPMIC	$2,000
6	11	30	Alma School Road: Arizona Canal to McDonald Drive	New construction	1.7	1,010		0.1	SRPMIC	$200
7	7	40	Dobson Road: AZ Canal to Indian Bend Road	New construction	1.8	439		0.7	BIA	$1,400
8	17	40	Center Street: McDonald to Indian Bend Road	New construction	0.0	50		1.0	SRPMIC	$2,000

Table 29 Road Preservation and Reconstruction Needs (continued)

SRPMIC Priority	Route	Section	Roadway	Description	Condition	Average Daily Traffic	Length (miles)		Route Owner	Cost Estimate (Thousands)
							Paved	Gravel		
9	300	20	Virginia Drive: Westwood Street to Extension Road	Reconstruction	1.9	50	0.2		SRPMIC	$400
10	103	10	Victory Acres1: Grand Street	Overlay	2.3	50	0.2		BIA	$60
		20	Victory Acres1: Glenrosa Drive		2.4	50	0.2		BIA	$60
		30	Victory Acres1: McDonald Drive		2.4	50	0.2		BIA	$60
		40	Victory Acres1: Monterosa Drive		2.4	50	0.1		BIA	$30
11	102	10	Dobson Heights: Pinchot Drive	Surface reseal	2.1	50	0.2		SRPMIC	$10
12	240	20	Montecito Avenue: Longmore Road to Standage	New construction	1.8	50		0.3	BIA	$600
		30	Montecito Avenue: Standage to Alma School Road		2.1	50	0.2		BIA	$400
		40	Montecito Avenue: Alma School Road to Beverly Road		1.9	50		0.1	BIA	$200
13	13	10	Extension Road: McDowell Road to Indian School Road	Reconstruction	2.2	1,152	2.0		BIA	$4,000
14	25	10	Harris Road: McDowell Road to Thomas Road	Reconstruction	2.3	204	1.0		BIA	$2,000

Table 29 Road Preservation and Reconstruction Needs (continued)

SRPMIC Priority	Route	Section	Roadway	Description	Condition	Average Daily Traffic	Length (miles)		Route Owner	Cost Estimate (Thousands)
							Paved	Gravel		
15	7	20	Dobson Road: McDowell Road to Camelback Road	Pavement rehabilitation	2.3	1202	2.5		BIA	$1,250
19	9	14	Longmore Road: Osborn Road to Indian School Road	Pavement rehabilitation/ reconstruction	1.8	1,636	0.5		BIA	$250
20	13	20	Extension Road: Indian School Road to Camelback Road	Pavement rehabilitation	1.9	876	0.5		BIA	$250
		25	Extension Road: Camelback Road to Chaparral Road		2.2	710	0.5		BIA	$250
21	9	16	Longmore Road: Indian School Road to Chaparral Road	Overlay	2.1	50	1.0		BIA	$300
22	5	10	92nd Street: McKellips Road to McDowell Road	Pavement rehabilitation	2.1	11,339	1.0		BIA	$1,050
24	9	10	Longmore Road: Palm Lane to Thomas Road	Pavement rehabilitation/ reconstruction	1.8	1,400	0.9		BIA	$450
25	22	10	Chaparral Road: Dobson Road to Alma School Road	Pavement rehabilitation	2.4	3,078	1.0		BIA	$500
		20	Chaparral Road: Alma School Road to Extension Road		2.3	1,684	0.5		BIA	$250
		30	Chaparral Road: Extension Road to Country Club Drive		2.4	1,162	0.5		BIA	$250

Table 29 Road Preservation and Reconstruction Needs (continued)

SRPMIC Priority	Route	Section	Roadway	Description	Condition	Average Daily Traffic	Length (miles)		Route Owner	Cost Estimate (Thousands)
							Paved	Gravel		
26	9	5	Longmore Road: McKellips Road to McDowell Road	Pavement rehabilitation	2.3	1400	0.8		BIA	$400
27	7	10	Dobson Road: McKellips Road to McDowell Road	Reconstruction	2.4	262	1.0		BIA	$2,000
28	15	30	Country Club Drive: Highland Avenue to Chaparral Road	Pavement rehabilitation	2.4	721	0.3		BIA	$150
29	19	10	Mesa Drive: SR-87 to Camelback Road	Pavement rehabilitation	2.4	1573	1.3		SRPMIC	$650
30	28	30	Osborn Road: Country Club Drive to Mesa Drive	Pavement rehabilitation	2.5	210	1.0		BIA	$500
31	15	10	Country Club Drive: Oak Street to Indian School Road	Pavement rehabilitation	2.5	971	1.5		BIA	$750
32	11	20	Alma School Road: Arizona canal bridge	Bridge replacement/rehabilitation	2.9	1010	-		SRPMIC	$650

Source: HDR Engineering, Inc., September 2010.

Notes: Pavement reconstruction - $1 million per lane mile includes pavement removal, grading, drainage, asphalt surfacing, pavement striping and marking.
Pavement overlay - $150,000 per lane mile includes 2" overlay, pavement striping and marking.
Pavement rehabilitation - $250,000 per lane mile includes 2" mill and replacement, pavement striping and marking.
New construction - $1 million per lane mile includes grading, drainage, asphalt surfacing, pavement striping and marking.
Surface reseal - $25,000 per lane mile.

5.2 Public Transit

There is a large unmet demand for transit services within the SRPMIC Community, as detailed in Section 4.0. Even with the modest population increase expected over the next twenty years, demand for transit services is expected to increase almost 46 percent over that period.

The public feedback the study team received regarding transit services was generally positive. Comments largely related to the desire for expanded hours of operation and increased frequency of service. The current demand-responsive service is convenient to users, but the zoned system, infrequent service, and lack of adequate wait-room facilities at the transit center makes transferring between zones difficult. In response to this desire for improved service, this study is recommending two Community circulator routes; one referred to as the Pima/Dobson Area Community Circulator and the other the People's Village/Lehi Community Circulator.

The Pima/Dobson Area Community Circulator is imagined as possibly being partially funded by the businesses in the corridor. The route would serve developing and established Pima Freeway corridor locations such as the Pima Center, the Pavilions and other regional shopping, the planned spring training facility and golf, casino and conference facilities. The People's Village/Lehi Community Circulator would provide service for the residential development areas of these communities. The circulators would have connections both to each other and the demand-response service at the Two Waters Government Complex.

As development occurs in the Pima Freeway corridor it is recommended that accommodations be requested for the future transit service described. In general, bus stops should be planned at a maximum distance of one-quarter mile apart, and in areas of higher density at a distance of one-eighth mile apart. Far side of intersection bus stops are preferable, located within 85 feet of intersection (± 25 feet).

The SRPMIC has demonstrated a commitment to provide transportation services to support the elderly and disabled in their community. In years where ADOT funding did not cover all of the expenses, tribal funds were used to supplement them. Looking ahead, the same commitment will be necessary to ensure the continued operation of the system.

In January of 2009, the Salt River Transit Five Year Plan was prepared. The Plan outlined specific implementation strategies to continue the existing service through the 2013 planning horizon. Based on this plan, the LRTP developed an estimate for services through the near-term planning horizon. These results may be found in Table 30. This estimate, based on the approved 2009 budget, includes the following assumptions:

- Administrative costs and Operating costs (driver/dispatch staff, communication and employee training and supplies) have been escalated at three percent annually.
- Cost for fuel, parts, maintenance, licenses and insurance have been escalated at five percent annually.
- Capital funding, based on anticipated cost for vehicle and equipment replacement are escalated at four percent annually.

Revenue sources assume that 2009 funding would continue with increases to cover the expense escalations noted above. The following assumptions are used to determine projected grant funding:

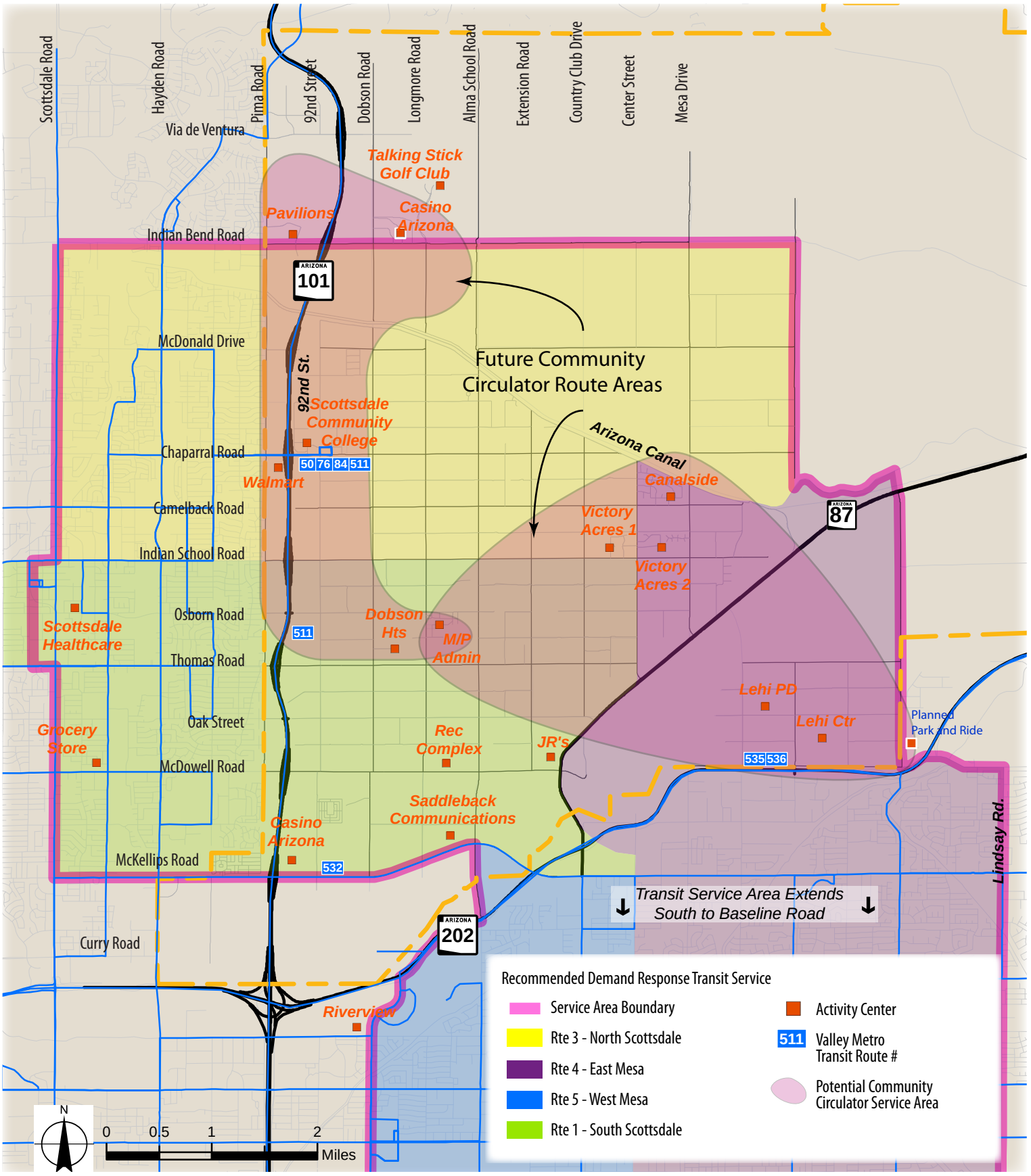
- Operating costs less farebox revenue are funded at a 58 percent federal/42 percent local match ratio.
- Administrative costs are funded at an 80 percent federal/20 percent local match ratio.
- Capital costs are assumed to be covered at the Section 5311 grant level of 80 percent federal/20 percent local match ratio.

Table 30 Salt River Transit System Five year Budget/Sources of Revenue

Description	2010	2011	2012	2013	2014	2015
Cost						
Administrative Costs	$78,000	$80,000	$83,000	$85,000	$88,000	$91,000
Operating Costs	$242,000	$250,000	$257,000	$265,000	$273,000	$281,000
Capital	$62,000	$65,000	$67,000	$70,000	$73,000	$76,000
Total Cost	**$383,000**	**$395,000**	**$407,000**	**$420,000**	**$434,000**	**$447,000**
Revenue Source						
Local Match						
Farebox	$13,000	$14,000	$14,000	$14,000	$15,000	$15,000
Salt River Tribe	$138,000	$142,000	$146,000	$151,000	$155,000	$160,000
Subtotal Local	*$151,000*	*$155,000*	*$160,000*	*$165,000*	*$170,000*	*$176,000*
Federal Grant Funding						
5311 Operations	$133,000	$137,000	$141,000	$145,000	$150,000	$154,000
5312 Administration	$63,000	$64,000	$66,000	$68,000	$70,000	$72,000
5313 Capital	$50,000	$52,000	$54,000	$56,000	$58,000	$61,000
Subtotal Grant	*$245,000*	*$253,000*	*$261,000*	*$270,000*	*$278,000*	*$287,000*
Total Revenue	**$383,000**	**$395,000**	**$407,000**	**$420,000**	**$434,000**	**$447,000**

Source: Salt River Transit Five Year Plan, January 2009; HDR Engineering, Inc., September 2010.

Table 31 shows improvement cost estimates for the transit improvements shown in Figure 24. This table includes the capital and operations costs for the new circulator service between the People's Village and Lehi, as well as the Pima Road and Dobson Road area.



Source: HDR Engineering, Inc., September 2010.

FIGURE 24 | Recommended Public Transit System

Table 31 SRPMIC Transit Improvement Cost Estimates

Route	Operations						Fleet		On-street Infrastructure	
	Headway (minutes)	Daily Trips Low	Daily Trips High	Service Span (hours)	Estimated Annual Cost Low[a]	Estimated Annual Cost High[a]	Fleet Required	Total Fleet Cost[b]	Basic Stop Unit Cost[c]	ADA Accessible Stop Unit Cost[d]
Pima/Dobson Area Community Circulator	30	25	50	12.5	$374,000	$747,000	5	$450,000	300	$3,000
Pima/Dobson Area Community Circulator	60	12.5	25	12.5	$187,000	$374,000	3	$270,000	300	$3,000
People's Village/Lehi Community Circulator	30	25	50	12.5	$615,000	$1,229,000	9	$810,000	300	$3,000
People's Village/Lehi Community Circulator	60	12.5	25	12.5	$307,000	$615,000	4	$360,000	300	$3,000

Source: HDR Engineering, Inc., September 2010.

Notes: a) Low estimate = one-way operations, high estimate = two-way operations; annual cost is net of passenger fares (based on inflated 2008 actual SRPMIC Transit cost\rev mile and fare recovery); estimated operating cost based on weekday operations only.

b) Fleet is based on a 16-passenger standard transit "cut-away" bus ($94,000 each).

c) Basic stop unit cost consists of sign, pole and installation.

d) ADA stop unit cost consists of ADA dimensioned concrete pad, sign, pole, bench and installation.

5.3 Trails and Paths System

The recommended Community trails system links schools, subdivisions and other destinations important to Community members. It is not anticipated that this system will be built overnight; rather, this LRTP lays out a framework for developing a system over time. Implementation of the trails plan will provide dedicated routes for pedestrians, bicyclists, and horseback riders to connect safely between activity centers. The recommended trail system for the SRPMIC is shown in Figure 25.

During the public outreach, the Transportation study team heard from several different voices that the Community prefers not to provide trails linkages to the greater metropolitan area. The trails plan reflects the Community's desire to have a system of non-motorized routes to access Community destinations and residential areas. The trails system is not an extension of the regional trails system; the paths/trails are envisioned being built for Community members only and not for the general public. This limitation would not extend to sidewalks along the local commercial, collector and arterial street types.

The non-motorized trails are composed of several components which work together to develop a trails system. To adopt a growing consensus on terminology, paths are paved routes and trails are unpaved routes. Paved path material can be asphalt, concrete, or other similar material. Unpaved trails can be the native surface with large rocks removed, stabilized granite, or other similar material.

Some of the trails system will be built as development occurs. For instance, Pima Road has completed final design and is expected to go to construction late in 2010. The Pima Road DCR identifies bicycle lanes along its length from McDowell to Via Linda. The Community is constructing an 8-foot sidewalk on the eastern side of Pima Road. Similarly with 92nd Street/Dobson Road, the expectation for this corridor is an 8-foot detached sidewalk on either side of the street, as shown in Figure 31.

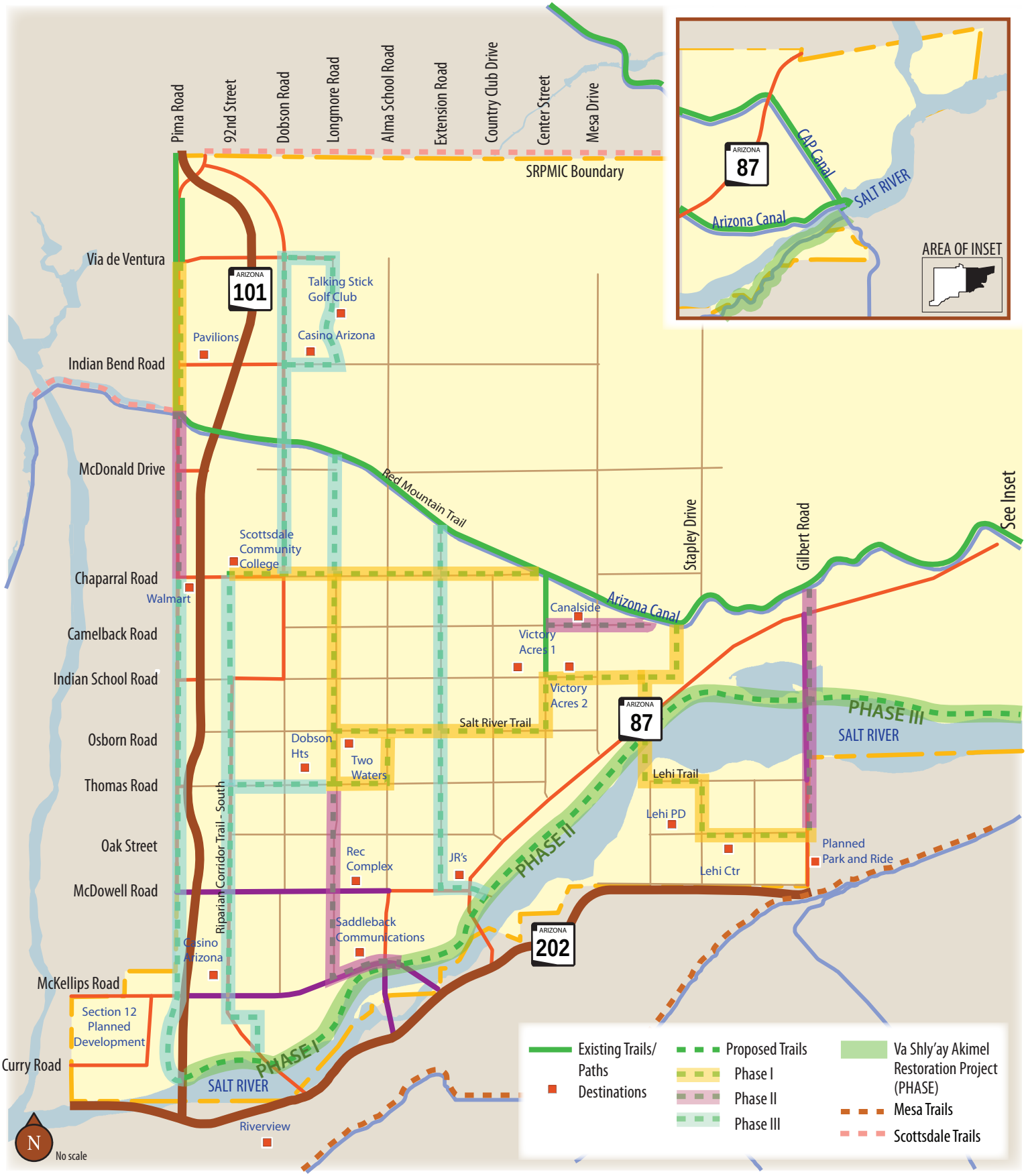
There are existing elements of the system in place. For example, a sidewalk is present on Center Street from Chaparral Road south to Indian School Road. Sidewalks are also present within the existing Canalside and Victory Acres subdivisions.

A commonly used trail sharing sign is shown to the right. A similar sign may be used on the Community's trails to alert users to the proper trail etiquette; bikers yield to hikers and horses, hikers yield to horses. The concept is that bikers are fast and can stop and go easily so everything else has the right of way. Horses are big and unpredictable so they get the right of way.

Bicycling

While bicycling was not brought up as a major concern through our outreach activities, it should be considered in the development of a multimodal system. The 8-foot trail may be used where bicycle traffic is expected to be low at all times, pedestrian use is only occasional, sightlines are good, and passing opportunities are provided.

For most of the routes within the Community where there are low traffic volumes, low speeds and sufficient shoulder width bicycles can comfortably share the road with vehicles. SR 87 has an effective shoulder width equal to or greater than 4 feet and is a popular route for bicyclists.



Source: HDR Engineering, Inc., September 2010.

FIGURE 25 | Recommended Non-Motorized Trail System

The recommended street sections include 6-foot bicycle lanes on both the 80-foot Urban Major Collector and 110-foot Urban Arterial.

Trails System Phasing

The trail system has been broken down into phases. The phases proposed are based on need and do not correlate with a specific implementation schedule as funding has not yet been identified for implementation of the trails plan. Construction costs for each of the phases are presented in Table 32. Appendix H includes trails plan segment information.

The Arizona Canal provides the central feature of the trail system. Bisecting the developed portion of the Community, its banks already provide a continuous informal trail through the Community. The Canal travels approximately 13 miles through the Community from the Granite Reef Diversion Dam to the Scottsdale border.

Phase I includes a loop around the Two Waters Government Complex that can be used by the health and Human Services Department and others to stage health walk events for the Community with a connection to the Scottsdale Community College and the Arizona Canal. Phase I also provides a connection to the Lehi Trail (identified in the General Plan), which follows the Horne Road alignment across the Salt River then along Thomas Road to Stapley Drive, then Oak Street past the Lehi Center to Gilbert Road. Phase I covers 15.2 miles.

Phase II provides connections from the Phase I loop past the Canalside and Red Mountain subdivisions to the Arizona Canal. An equestrian trail is planned along the east side of Gilbert Road providing a connection between an Equestrian Trailhead Area at the planned Red Mountain Park and Ride Facility and the Salt River to the north. Phase II also envisions a connection between the Two Waters Government Complex and Phase I of the Va Shly'ay Akimel Salt River Restoration Project, which will include an additional 5.1 miles of trail (The Va Shly'ay Akimel Salt River Restoration Project has its own phasing plan – Phase I of the project is currently under design). Phase II covers 8 miles (excluding the Va Shly'ay Akimel Salt River Restoration Project trails).

Phase III of the trail system essentially provides additional north–south connectivity throughout the Community, providing a trail connection to the enterprise developments to the north (Talking Stick Golf Club, The Salt River Conference Center, and the spring training facility). This phase envisions a mixture of 8-foot trails and a more urban street section on 92nd Street with 8-foot sidewalks on either side of the street. Phase III covers 17.9 miles.

Va Shly'ay Akimel Salt River Restoration Project recently received American Recovery and Reinvestment Act (ARRA) funding for $645,000 to fund initial design and construction of the first phase of work. The project is envisioned to include passive recreation features consisting of approximately 5.1 miles of multi-use decomposed granite trails, parking lots with trailheads, rest stops and interpretive signs along the northern banks of the Salt River.

Cost Estimate

Challenges facing the Community for the development of a non-motorized transportation system are not unlike those faced by other rural communities: there is a lack of right-of-way and a lack of sidewalks; trails are not a requirement of development and there are no existing standards requiring them or defining their appearance; and finally there is no dedicated funding available to construct trails.

The lack of funding should not deter the Community from planning a trails and path system. There are funding sources available to assist tribes with funding projects such as trails and these are further discussed in Section 5.4.

Costs for the Non-motorized Trails Plan are found in Table 32. The table provides planning level construction costs (in 2010 dollars) for each Phase of the 2030 Non-Motorized Trail and Path System. Amenities such as shade ramadas, benches, and trash receptacles are not included in this cost estimate.

Table 32 Non-Motorized Trail System Planning Level Cost Estimate

Phase	Item	Qty (miles)	Unit Cost (Thousands)	Total Cost (Thousands)
Phase I				
	8′ Trail[a]	3.5	$60	$210
	8′ Sidewalk[a]	11.7	$360	$4,212
	15 percent contingency for drainage and slope conditions for paths/trails (for 3.5 miles)	1 each	$9	$32
	Revegetation[b]	3.5	$100	$350
	Subtotal			*$4,804*
Phase II				
	8′ Trail[a]	6.5	$60	$390
	8′ Sidewalk[a]	1.5	$360	$540
	15 percent contingency for drainage and slope conditions for paths/trails (for 6.5 miles)	1 each	$9	$59
	Revegetation[b]	6.5	$100	$650
	Subtotal			*$1,639*
Phase III				
	8′ Trail[a]	9.1	$60	$546
	8′ Sidewalk[a]	8.5	$360	$3,060
	10′ Multi-use Trail[a]	0.3	$450	$135
	15 percent contingency for drainage and slope conditions for paths/trails (for 9.1 miles)	1 each	$9	$82
	Revegetation[b]	9.1	$100	$910
	Subtotal			*$4,733*
	Total			**$11,175**

Source: HDR Engineering, Inc., September 2010.

Notes: a) Path/trail costs include general signing. Costs also presume projects may be funded with federal dollars and several percentage of construction costs are added (3 percent topography survey + 15 percent PS&Es + 5 percent drainage report + 1 percent SWPP plan + 8 percent mobilization + 5 percent traffic control + 1 percent survey control + 18 percent administrative costs + 5 percent contingencies = 61 percent)
b) Revegetation includes seeding areas disturbed by construction, generally 5 feet on either side of the path/trail, and trees where clear zones allow.

5.4 Transportation Funding

The construction, operation, and maintenance of the SRPMIC transportation system relies on the coordination of numerous entities and agencies. The Community, ADOT, Maricopa County, BIA, and neighboring jurisdictions of Scottsdale and Mesa all play an integral part. For this reason, the LRTP is critical for guidance and providing understanding of the projects that will emerge as the Transportation Improvement Program (TIP).

There are other TIPs that are relevant and directly applicable to the Community's transportation plan:

- Indian Reservation Roads Transportation Improvement Program (IRRTIP)
- The Maricopa Association of Government's Regional Transportation Program (RTP)
- ADOT's Statewide TIP
- Maricopa County's TIP

The Tribal Transportation Improvement Program (TTIP) is the list of Tribal transportation projects to be funded in the near term. The TTIP is defined in the U.S. Code of Federal Regulations (CFR) in Title 25, Section 170.5 (also known as the IRR Rule), as "a multiyear financially constrained list of proposed transportation projects developed by a Tribe from the Tribal priority list or the long-range transportation plan." According to 25 CFR 170.421, the TTIP:

- Must be consistent with the Tribal long-range transportation plan.
- Must be fiscally constrained; the costs of the projects cannot exceed the amount of funds available within each year.
- Must contain all IRR program funded projects scheduled for construction in the next 3–5 years.
- Must identify the implementation year of each project scheduled to begin within the next 3–5 years.
- May include other Federal, state, county and municipal transportation projects initiated by or developed in cooperation with the Tribal government.
- May undergo reviews and updates as necessary by the Tribal government.
- Can be changed only by the Tribal government.
- Must be forwarded to the BIA by resolution or by tribally authorized government action for inclusion in the IRRTIP.

The TTIP is a document that shows the proposed projects of the Community over the next 5 years. The projects identified as transportation needs and priorities through the comprehensive LRTP move towards implementation through the TTIP development; the TTIP identifies the Community's top transportation priorities (those that can be funded) from the LRTP.

The BIA is responsible for developing an IRRTIP after consulting with the Community in regard to their TTIP and priorities.

Additional information may also be found at the State of Arizona Tribal Transportation website, a central location for state-tribal transportation related partnerships, projects, activities, groups, links, and other related information. http://aztribaltransportation.org/aztt/FAQ/Federal_funding_faq.asp

In comparison to the TTIP, the Tribal priority list includes all of the transportation projects the Community has identified including those without a funding source.

Road Revenue Sources

A financial analysis of the specific projects that implement the transportation plan will help to ensure that it is realistic. Good planning, including the IRR TTIP and LRTP, will enable the Community to have the documentation and public support needed to act quickly when new or unplanned sources of funds become available.

Tribes are eligible for a number of transportation funding sources including funds through FHWA, Federal Lands Highways (FLH), FTA, and possible state funding as well.

Indian Reservation Roads (IRR) Program

The IRR program of the Federal Lands Highway Program (FLHP) is the primary funding source for transportation projects within the Community. The FHWA and BIA jointly administer the program.

IRR program funds may be used to fund transportation planning, research, engineering and construction or reconstruction of any type of transportation project eligible for assistance under Title 23 that provides access to or within Community. These include, but are not limited to, road, bridge, transit, and pedestrian and bicycle facilities. In addition, IRR funds can also be used as the state/local match for most types of Federal-aid highway funded projects.

IRR funds shall only be expended on eligible projects identified in the IRR TIP approved by the Secretary. Title 25 in the US Code of Federal Regulations Part 170, Indian Reservation Roads Program; Final Rule (US, 2004) establish the policies and procedures governing the Indian Reservation Roads (IRR) Program.

The Relative Need Distribution Factor

IRR funds for an individual tribe are determined by the Tribal Transportation Allocation Methodology that includes a Relative Need Distribution Factor (RDNF) for allocating IRR Program funds. The Relative Need Distribution Factor is used to allocate the funds remaining after appropriate statutory and regulatory set-asides (as well as other takedowns). The RDNF uses the following formula:

- 50 percent Cost-to-Construct + 30 percent Vehicle Miles Traveled + 20 percent Population

The cost to construct component is the total estimated cost of a tribe's transportation projects as a percentage of the total estimated cost nationally of all tribes' transportation facilities. These costs are derived from the IRR inventory of eligible IRR transportation facilities developed and approved by BIA and tribal governments through the LRTP. Vehicle miles traveled is a measure of the current IRR transportation system usage (sum of the length of the IRR route segments multiplied by the ADT of that segment).

Population Adjustment Factor (PAF) Allocation

If Congress increases appropriations for the IRR Program above the level of $275 million (in 2009 the IRR program was funded at $450 million), 12.5 percent of the increase, after takedowns, will be used for a new small minimum allocation, PAF, for all tribes based on population ranges.

Two Percent Tribal Transportation Planning

Up to two percent of funds made available for IRR for each fiscal year shall be allocated to those Indian Tribal Governments applying for transportation planning. Table 33 summarizes the IRR funding for SRPMIC for the past six years.

Table 33 Indian Reservation Roads Funding, 2005–2010

FY	Construction	Population Adjustment	2 Percent Planning	Total
2005	$998,570	$5,250	$23,810	$1,027,630
2006	$1,038,230	$11,930	$25,060	$1,075,210
2007	$999,950	$22,590	$24,510	$1,047,050
2008	$819,320	$31,880	$20,410	$871,600
2009	$866,370	$42,160	$21,800	$930,330
2010	$2,233,860	$41,740	$56,160	$2,331,760

Source: Salt River Pima-Maricopa Indian Community, September 2010.

Existing or proposed roads in the BIA system that are considered to have a construction need by the Community are included in the cost to improve calculations. These roads are also identified by construction need (CN) in the IRR road inventory. Currently only the roads with a construction need category of 1, 2 and 4 are included in the cost to improve calculations. These are defined as follows: Construction Need 1 (CN1): Existing roads needing improvement; Construction Need 2 (CN2): Non BIA roads are also considered; Construction Need 4 (CN4): Roads that do not currently exist and need to be constructed (proposed roads).

Regional Transportation Plan

The RTP is a comprehensive, performance based, multimodal and coordinated regional plan, covering the period through Fiscal Year (FY) 2031. The RTP is prepared, updated and adopted by the Maricopa Association of Governments, which is the regional planning agency for the Maricopa County area. SRPMIC is a member of the Maricopa Association of Governments.

The RTP guides transportation investments in the region for the next 20 plus years. The RTP funding was approved by a public vote on November 2, 2004 (Proposition 400). The measure resulted in continuation of a half-cent sales tax for transportation, funding the $16 billion RTP.

The RTP includes funding for three Salt River bridge crossings within the Community: Gilbert Road, Dobson, and McKellips (in that order). The RTP's 2010 Annual Report identifies the Gilbert Road and Dobson Road bridges over the Salt River in the Phase II improvements (2011–2015), and the McKellips Road bridge over the Salt River in the Phase III improvements (2016–2020).

Surface Transportation Program (STP)

The Surface Transportation Program (STP) is one of the major federal highway funding programs. The STP provides the bulk of federal money to the states and the Federal Lands Highway Program. Funds flow through the state but are divided by MAG through the RTP. STP funds can be used on roads classified higher than "rural minor collector". FHWA records "rural locals" by county. Up to 15 percent of rural STP funds can be used on rural minor collectors.

SRPMIC Development Fees (SRO-348-09)[9]

The Community collects fees from new development to finance, defray, or reimburse all or a portion of the costs incurred by the Community for public improvements necessitated by and provided to serve such development. These fees are assessed on new nonresidential development within the Transportation Development Fee Service Area delineated in the ordinance (generally identified as the Pima Corridor, Salt River and McDowell Road corridors east to the Country Club Drive alignment) to offset nonresidential development's fair share impact on transportation facilities.

At least once every three years the Community updates the technical report that provides the basis for fees. Currently, this update is anticipated late in 2010; consideration of the results and recommendations of this plan will be incorporated into this update.

The current economic downturn has impacted development on the Community, and as a result minimal fees have been collected for transportation improvements for the fiscal year 2010. It is assumed that contributions to the development fee fund will increase in the near future.

Federal Lands Highway-Discretionary Funds

Federal Lands Highway-Discretionary Funds are available from the FHWA - Federal Lands Highway Office, through state DOTs, for road construction projects, and transportation planning that promotes and/or benefits tourism and recreational travel. Applications for these funds are submitted by the Community to the state DOT.

IRR Construction Funds

IRR Construction Funds are available from the BIA for the construction and improvement of roads, bridges and transit facilities, and for transportation planning projects/activities, under a P.L. 93-638 contract or grant.

IRR Bridge Program Funds

IRR Bridge Program Funds are available from the BIA for the rehabilitation or reconstruction of deficient BIA bridges or any IRR system bridge, under a P.L. 93-638 contract.

IRR High Priority Project Program

The IRR High Priority Project Program (IRRHPP) creates a national funding pool for IRRHPP using five percent of IRR Program construction funds. These funds are available on an application basis for tribal projects needed for emergencies or disasters, or for tribes whose funding allocation under the formula is insufficient to build their highest priority project. IRRHPP projects are ranked based on established criteria for emergency and non-emergency submittals and may not exceed $1 million.

Highway Expansion and Extension Loan Program (HELP)

HB 2488, enacted into law on August 21, 1998, established a comprehensive loan and financial assistance program for eligible highway projects in Arizona. The new program designated as Highway Expansion and Extension Loan Program or HELP provides the state and communities in Arizona a new financing mechanism to stretch limited transportation dollars and bridge the gap between the needs and available revenues.

The program is currently suspended (see http://www.azdot.gov/Inside_ADOT/help/PDF/helprprt09.pdf).

[9] *SRPMIC Infrastructure Improvement Plan and Development Fee Study, April 17, 2009.*

Transit Revenue Sources

Tribal transit funds can be pursued through the U.S. Department of Transportation, the U.S. Department of Agriculture, the U.S. Department of Housing and Urban Development and the U.S. Department of Labor. Some federal sources include the FTA Tribal Transit Program and the BIA Indian Reservation Roads Program. Transit projects undertaken through Title 49 Section 5310 Elderly and Persons with Disabilities Transportation Program and 5311 Rural Public Transportation Program will be selected by the state in consultation with local officials.

Projects funded from Federal Transit Act funds will be selected by the state in cooperation with the appropriate affected local officials and transit operators.

Non-motorized Revenue Sources

Various phases of this project qualify for at least three federal funding programs. The programs fund on an annual basis which is beneficial for the applicant. If an application is rejected on the first attempt, updates to better qualify for funding in the next round are simpler than preparing a new application.

Transportation Enhancements Funds

Annually, some twenty projects statewide are awarded Transportation Enhancement funding. The cap for local projects was increased to $750,000 in 2010 which would only fund a portion of Phase I of the plan. The cap for state projects (those located on a minimum of 75 percent ADOT right-of-way) will continue to be $1.0 million. This mechanism may be useful to augment other funding for this or subsequent phases. Applications are evaluated and prioritized by MAG before the ADOT makes the final project selection. Much of the data needed to complete the application is contained in this plan.

Safe Routes to School

These funds can only be used to assist children in gaining safe, reliable pedestrian/bicycle routes to school from their residences. The Congressional apportionments of Safe Routes to School funding for Arizona, over the life of SAFETEA-LU bill, is $11,295,446. The infrastructure cap is $300,000; the non-infrastructure cap is $45,000. This is an annual source and very competitive.

Other Resources

The FHWA Office of Planning has developed a funding resources module in cooperation with the BIA, the Tribal Technical Assistance Program, other FHWA offices, and the FTA Office of Planning and Environment. The module identifies funding programs and strategies to assist Tribal governments with transportation planning and contains detailed information on 36 federal funding programs and the eligibility criteria for each. The resource, *Tribal Transportation Funding Resources*, is available online at http://www.tribalplanning.fhwa.dot.gov/ttfundresource_a.aspx.

ADOT has developed the *Transportation Planning and Programming Guidebook for Tribal Governments*. The guidebook is meant to provide transportation planning assistance in understanding the ADOT planning and programming processes and associated funding sources. Another resource ADOT-MPD is currently preparing is a document entitled, *The Arizona Tribal Transportation Funding Guidebook*. This document is expected to be finalized in the near future. It includes information on various funding opportunities from non-tribal levels of government.

Additional Considerations

The Community should ensure that they have some projects "ready to go" to take advantage of subsequent rounds of federal financing or any new funding sources. In addition, the Community should begin public involvement and determine conformity and other planning process steps that are required for a new proposed project.

"Ready to go" project examples include chip seal and dust suppression projects, traffic signal upgrades, dynamic message signs, road striping, guardrail replacement, and traffic sign upgrades. Use of federal funds does require environmental clearance.

2030 Revenue Forecast

Financing the transportation improvements identified in the SRPMIC LRTP involves numerous funding sources and strategies. Transportation funding is dynamic and there is a need to continuously monitor the existing sources as well as new sources as they may become available at the regional, state, and federal level.

The only assured transportation funding for the SRPMIC is the IRR funding. Current (2010) and previous year funding may be found in Table 33.

5.5 Priority Project List

This list of projects is provided to satisfy BIA IRR LRTP requirements. Additional information about each of projects may be found in either Table 25 or Table 29.

1. Oak Street (Route 30): Horne Road to Gilbert Road. Reconstruct a 1.6 mile segment of pavement currently in fair condition. This includes grading, drainage and paving.
2. Pima Road (Route U099): McDowell Road to Via de Ventura. Widen Pima Road to two lanes in each direction. This improvement will improve mobility and access to development planned in the corridor, including the SRPMIC Spring Training Facility.
3. Jackrabbit Road (Route 20): Alma School Road to Beverly Street. Reconstruct the 0.1 mile segment of very poor pavement. This includes grading, drainage and paving.
4. McDonald Drive (Route 18): Alma School Road to Olive Street. New construction to grade, drain and pave a gravel road with up to 185 ADT.
5. Mesa Drive (Route 19): Chaparral Road to Indian Bend Road. New construction to grade, drain and pave this segment of gravel road.
6. Alma School Road (Route 11): Arizona Canal to McDonald Drive. New construction to grade, drain and pave this segment of gravel road.
7. Dobson Road (Route 7): AZ Canal to Indian Bend Road. New construction to grade, drain and pave this segment of gravel road.
8. Center Street (Route 17): McDonald to Indian Bend Road. New construction to grade, drain and pave this segment of gravel road.
9. Virginia Drive (Route 300): Westwood Street to Extension Road. Reconstruct a 0.2 mile segment of very poor pavement. This includes grading, drainage and paving.

10. Victory Acres 1 (Route 103): Pavement overlay.
11. Dobson Heights (Route 102): Pinchot Drive. Reseal pavement surface on 0.2 mile segment.
12. Montecito Avenue (Route 240): Longmore Road to Beverly Road. New construction to grade, drain and pave this 0.6 mile segment of road.
13. Extension Road (Route 13): McDowell Road to Indian School Road. Reconstruct a 2.0 mile segment of pavement currently in fair condition. This includes grading, drainage and paving.
14. Harris Road (Route 25): McDowell Road to Thomas Road. Reconstruct a 1.0 mile segment of pavement currently in fair condition. This includes grading, drainage and paving.
15. Dobson Road (Route 7): McDowell Road to Camelback Road. Rehabilitate pavement on 2.5 mile segment currently in fair condition with 1,200 ADT.
16. Multi-Family Village Roads (Route 108): New local residential roads are needed to serve this planned SRPMIC housing development.
17. Country Club Subdivision (Route 109): New local residential roads are needed to serve this planned SRPMIC housing development.
18. Center Street Subdivision Roads (Route 110): New local residential roads are needed to serve this planned SRPMIC housing development.
19. Longmore Road (Route 9): Osborn Road to Indian School Road. Rehabilitate and reconstruct pavement on this 0.5 mile segment with 1,636 ADT. Pavement condition is poor.
20. Extension Road (Route 13): Indian School Road to Chaparral Road. Rehabilitate pavement on 1 mile segment currently in poor to fair condition with 710 to 876 ADT.
21. Longmore Road (Route 9): Indian School Road to Chaparral Road. Pavement overlay on 1 mile segment.
22. 92nd Street (Route 5): McKellips Road to McDowell Road. Rehabilitate pavement on 1 mile segment currently in fair condition with 11,339 ADT.
23. Spring Training Facility Roads (Route 991): Widen Spring Training Facility internal roads to two lanes in each direction to improve access and mobility.
24. Longmore Road (Route 9): Palm Lane to Thomas Road. Rehabilitate and reconstruct pavement on this 0.9 mile segment with 1,400 ADT. Pavement condition is poor.
25. Chaparral Road (Route 22): Dobson Road to Alma School Road. Rehabilitate pavement on 2 mile segment currently in fair condition with ADT ranging from 1,162 to 3,078.
26. Longmore Road (Route 9): McKellips Road to McDowell Road. Rehabilitate pavement on 0.8 mile segment currently in fair condition with 1,400 ADT.
27. Dobson Road (Route 7): McKellips Road to McDowell Road. Reconstruct pavement on this1 mile segment currently in fair condition with 262 ADT.
28. Country Club Drive (Route 15): Highland Avenue to Chaparral Road. Rehabilitate pavement on this 0.3 mile segment currently in fair condition with 721 ADT.

29. Mesa Drive (Route 19): SR-87 to Camelback Road. Rehabilitate pavement on this 1.3 mile segment currently in fair condition with 1,573 ADT.

30. Osborn Road (Route 28): Country Club Drive to Mesa Drive: Rehabilitate pavement on this 1.0 mile segment currently in fair condition with 210 ADT.

31. Country Club Drive (Route 15): Oak Street to Indian School Road: Rehabilitate pavement on this 1.5 mile segment currently in fair condition with 971 ADT.

32. Alma School Road (Route 11): Arizona Canal Bridge: Replace or rehabilitate the bridge over the Arizona Canal. The ADT on Alma School Road at the bridge is 1,010.

33. Traffic Calming Measures (Various Routes): Implement traffic calming measures at locations selected by the SRPMIC Tribal Council to reduce non-Community cut-through traffic.

34. Longmore Road (Route 9): Talking Stick Resort to Via de Ventura. Construct new road with one lane in each direction to complete the connection between Indian Bend Road and Via de Ventura.

35. Curry Road (Route 992) Extension: McClintock Road to McKellips Road. Construct new road with two lanes in each direction. This new road will provide access to commercial development planned in Section 12.

36. Section 12 Infrastructure Roads (Route 992): Development of Section 12 south of McKellips Road west of the Pima Freeway will require numerous local roads to support planned commercial development.

37. Dobson Road (Route 7): Via de Ventura to 90th Street: New road with one travel lane in each direction with a center two-way left turn lane. This road will connect the Talking Stick Resort to 90th Street and Pima Road providing access to commercial development in the corridor.

38. Dobson Road (Route 7): Arizona Canal Bridge. Build new crossing over the Arizona Canal at Dobson Road with two lanes in each direction. This new crossing will provide connection between the Talking Stick Resort and the Scottsdale Community College.

39. 92nd Street and McDowell Road (Routes 5 and C004): Reconstruct intersection to align north and south legs. This improvement is needed as part of the overall upgrade of the 92nd Street/Dobson Road corridor.

40. 92nd Street (Route 5): McKellips Road to McDowell Road. Widen 92nd Street to two lanes in each direction. This widening is needed to accommodate additional traffic forecasted to use the segment once the new Dobson Road Salt River bridge crossing is in place and to provide access to Casino Arizona.

41. 92nd Street (Route 5): McDowell Road to Indian School Road. Widen to one lane in each direction with a center two-way left turn lane. This widening will improve access to planned commercial development east of the Pima Freeway.

42. Indian School Road (Route 1): Pima Freeway (L101) to Dobson Road. Widen to one lane in each direction with a center two-way left turn lane. This widening will improve access to planned commercial development east of the Pima Freeway.

43. Dobson Road (Route 7): Indian School Road to McDonald Drive. Widen to one lane in each direction with a center two-way left turn lane. This widening will improve access to planned commercial development east of the Pima Freeway.

44. Chaparral Road (Route C022): 92nd Street to Dobson Road. Widen to two lanes in each direction. Part of the 92nd Street/Dobson Road corridor, this widening will improve access to planned commercial development east of the Pima Freeway.

45. Lehi Crossing (Route 30): Beeline Highway (SR 87) to Horne Road. This new riverbed crossing of the Salt River will improve access between Lehi and the Salt River portions of the SRPMIC.

46. Pima Freeway (Route S101): Red Mountain Freeway (L202) to Shea Boulevard. Widen to four general purpose lanes and one HOV lane in each direction. Additional capacity is required to accommodate additional traffic resulting from regional population and employment growth.

47. Red Mountain Freeway (Route S202): Pima Freeway (L101) to Gilbert Road. Widen to four general purpose lanes and one HOV lane in each direction. Additional capacity is required to accommodate additional traffic resulting from regional population and employment growth.

48. Gilbert Road (Route C027): Thomas Road to SR 87 (Beeline Highway): Construct new all-weather Salt River bridge crossing with three lanes in each direction. This improvement is needed to replace a bridge washed away by flooding and provide adequate road capacity to accommodate regional population and employment growth.

49. McKellips Road (Route C002): Pima Freeway (L101) to Red Mountain Freeway (L202): Widen to three lanes in each direction. These improvements are needed to accommodate growth in regional non-Community traffic.

50. McKellips Road (Route C002): Salt River Bridge. Construct a new 6-lane bridge over the Salt River to provide an all-weather crossing.

51. Dobson Road (Route 7): Red Mountain Freeway (L202) to McKellips Road. New Salt River bridge crossing with two lanes in each direction. This new bridge is needed to improve mobility across the Salt River providing access to the SRPMIC 92nd Street/Dobson Road corridor.

52. Beeline Highway (Route 87): Red Mountain Freeway (L202) to Shea Boulevard. Widen road to three lanes in each direction to accommodate traffic growth from increases in regional population and employment.

53. Pima Freeway and Pima Road/90th Street Traffic Interchange (Route U099): Add turn lanes and through lanes as needed to accommodate anticipated traffic growth from increases in regional population and employment.

54. Pima Freeway and McDonald Traffic Interchange (Route S018): Add turn lanes and through lanes as needed to accommodate anticipated traffic growth from increases in regional population and employment.

55. Pima Freeway and Thomas Road Traffic Interchange (Route S030): Add turn lanes and through lanes as needed to accommodate anticipated traffic growth from increases in regional population and employment.

56. **Pima Freeway and McDowell Road Traffic Interchange (Route S004):** Add turn lanes and through lanes as needed to accommodate anticipated traffic growth from increases in regional population and employment.
57. **Pima Freeway and McKellips Traffic Interchange (Route S002):** Add turn lanes and through lanes as needed to accommodate anticipated traffic growth from increases in regional population and employment.
58. **Chaparral Road (Route T022): Scottsdale Community College to Arizona Canal.** Construct 8-foot trail on 2.9 mile segment.
59. **Longmore Road (Route T009): Chaparral Road to Osborn Road.** Construct 8-foot trail on 1.5 mile segment.
60. **Center Street (Route T017): Indian School Road to Osborn Road.** Construct 8-foot trail on 0.5 mile segment.
61. **Osborn Road (Route T028): Longmore Road to Center Street.** Construct 8-foot trail on 2.0 mile segment.
62. **Chaparral Road (Route T022): Pima Freeway to Scottsdale Community College.** Construct 8-foot trail on 0.3 mile segment.
63. **Longmore Road (Route T009): Osborn Road to McKellips Road.** Construct 8-foot trail on 3.2 mile segment.
64. **Lehi Trail (Route T032): Arizona Canal to Gilbert Road.** Construct 8-foot trail on 4.1 mile segment.
65. **Gilbert Road (Route (T027): Arizona Canal to McDowell Road.** Construct 8-foot trail on 2.8 mile segment.
66. **Camelback Road (Route T024): Center Street to Arizona Canal.** Construct 8-foot trail on 1 mile segment.
67. **Longmore Road (Route T009): Arizona Canal to Chaparral Road.** Construct 8-foot trail on 1.1 mile segment.
68. **Extension Road (Route T013): Arizona Canal to McDowell Road.** Construct 8-foot trail on 3.4 mile segment.
69. **92nd Street (Route T005): Chaparral Road to McKellips Road.** Construct 8-foot trail on 4 mile segment.
70. **92nd Street (Route T005): McKellips Road to Salt River.** Construct 0.3 mile 10-foot multi-use trail.
71. **Dobson Road (Route T007): Talking Stick Resort to Chaparral Road.** Construct 8-foot trail on 2 mile segment.
72. **Indian Bend Road (Route T014): Pima Road to Talking Stick Resort.** Construct 6-foot sidewalk on 1.5 mile segment.

73. Va Shly'ay Akimel (Route T006): Pima Freeway to Granite Reef Diversion Dam. Construct multi-use trails, parking lots with trailheads, rest stops and interpretive signs on 13.9-mile segment.

74. Arizona Canal (Route T016): Pima Road to Granite Reef Diversion Dam. Construct multi-use trails, parking lots with trailheads, rest stops and interpretive signs on 13-mile segment.

75. Routine Maintenance (various routes): Various routine maintenance projects will be identified in the TTIP as necessary. Maintenance projects will be limited to the 25% allowable amount of IRR Construction Fund.

76. Transportation Planning (various routes): Various planning projects that may arise and are in excess of the 2% planning funds allocated through the BIA IRR funding formula. Projects will be identified in the TTIP as necessary.

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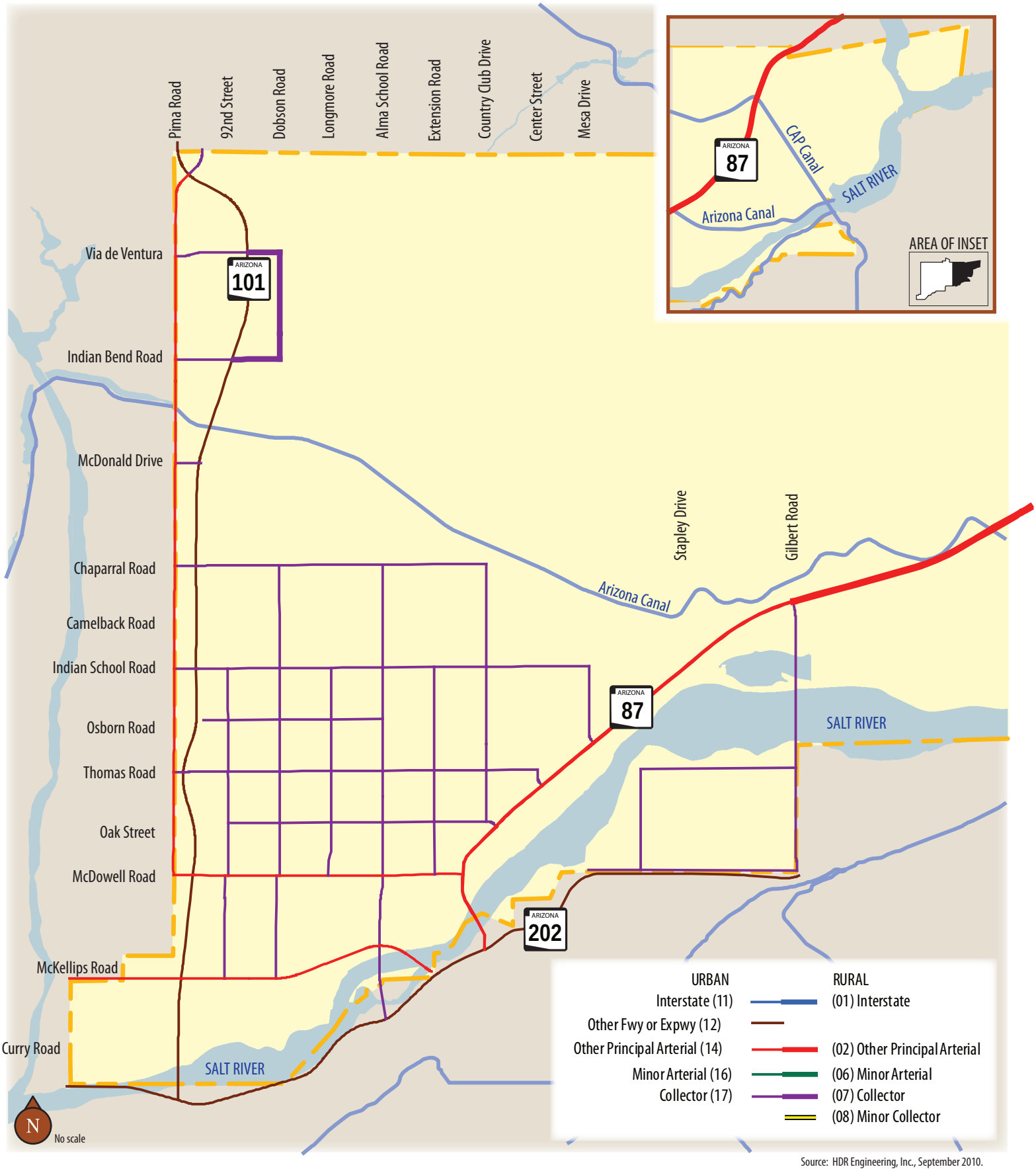
6.0 Policies and Guidelines

This section presents the policies and guidelines needed to implement the recommendations of this transportation study. This includes typical road cross-sections by functional classification, traffic impact study guidelines and access management recommendations.

6.1 Functional Classification

Figure 26 shows updated FHWA functional classification for Community roads. Planned roads can be given an FHWA functional classification once they are funded for construction in a transportation improvement program.



Source: HDR Engineering, Inc., September 2010.

FIGURE 26 | Recommended 2010 Federal Functional Classification System

6.2 Typical Road Cross Sections

Through the project outreach we have heard from the Community that there is a desire for facilities to serve pedestrians. In areas where pedestrian routes are needed along a road to provide access between facilities, shoulders are not usually appropriate as pedestrian facilities. In such cases a full sidewalk or paved path, raised and or/separated from the street, should be considered. This is already the case in the People's Village (where the population density is expected to exceed 1,000 per square mile) where subdivision standards currently require curb, gutter and sidewalks to accommodate pedestrians.

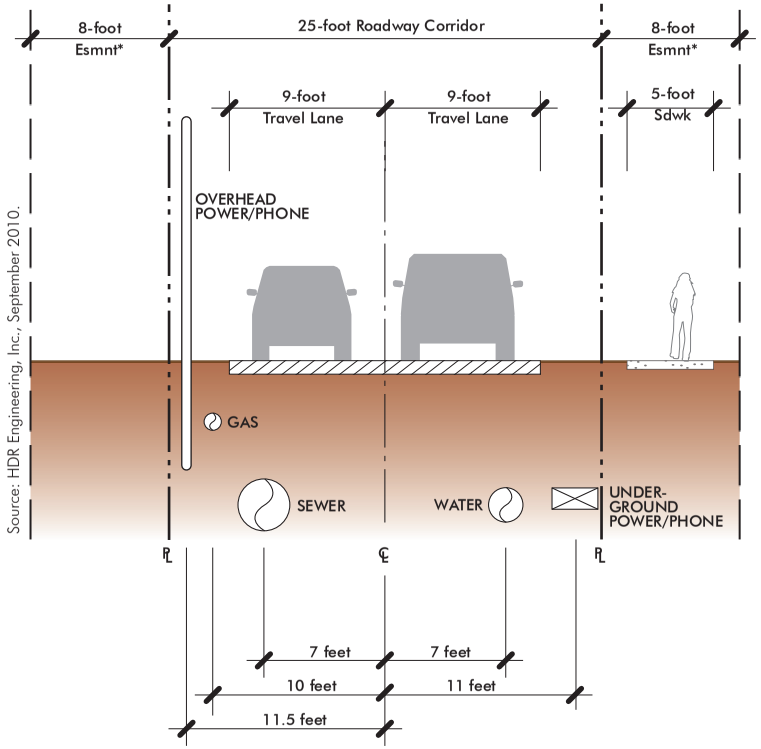
Table 34 shows the seven typical road cross sections and design standards recommended for 2010 SRPMIC LRTP. These cross sections include sidewalks and multi-use trails to support the recommended SRPMIC trail system shown in Figure 25. Both the Urban Major Collector and the Rural Minor Collector have 11-foot travel lanes to help reduce travel speeds within the Community. For rural arterial roads, SRPMIC will use either MCDOT or ADOT standards. These typical cross sections are shown in Figure 27 to Figure 33.

In general, trails and sidewalks should be on the north or west side of the roads. These cross sections are reversible meaning that trails or sidewalks could be placed on either side of the road depending on topographic constraints. For more detailed guidelines, developers should reference the SRPMIC Community Development Department's development code for road landscaping, sidewalks, trails and other development standards. Figure 34 shows the location of the SRPMIC recommended road cross sections. Not all cross sections are shown on this exhibit.

Table 34 Street Section Descriptions

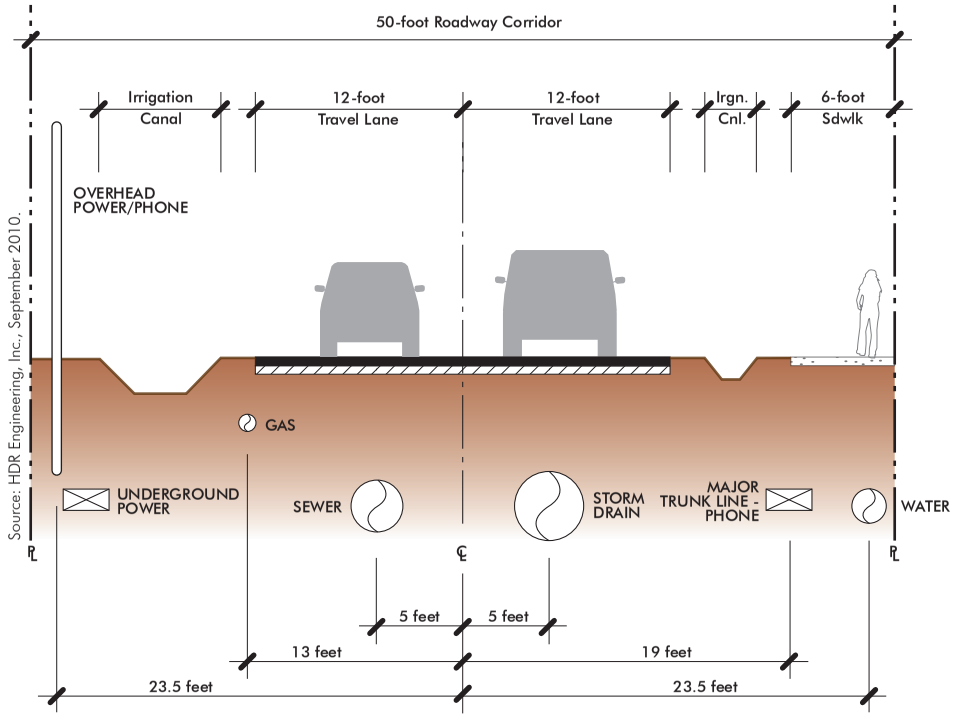
Street Section Name	Right-of-Way	Design Speed	Average Daily Traffic (ADT)	Sidewalks	Lanes	Landscaping
Rural Access Way	25′	15 mph	<50 vehicles per day (vpd)	None	2 travel lanes (9′)	None
Rural Local Road	50′	20 mph	50 to 1,000 vpd	6′ detached, one side	2 travel lanes (11′); shoulder (1′)	None
Urban Local Residential	50′	20 mph	1,500 vpd Max.	5′ attached, both sides	2 travel lanes (10′); on-street parking (8′)	None
Urban Local Commercial	60′	20 mph	5,000 vpd. Max.	8′ detached, both sides	2 travel lanes (13′)	4′ min. parkway strip between curb and sidewalk
Urban Major Collector	80′	30 mph	5,000 to 15,000 vpd	8′ detached, both sides	2 travel lanes (11′); center turn lane (14′); bike lanes (6′)	6′ min. parkway strip between curb and sidewalk
Rural Minor Collector	80′	30 mph	1,000 to 15,000 vpd	8′ detached one side, 8′ trail one side with irrigation	2 travel lanes (11′); shoulder (3′)	None
Urban Arterial	110′	45 mph	15,000 to 35,000 vpd	8′ detached, both sides	4 travel lanes (2 - 14', 2 - 12'); bike lanes (6′)	16′ center median;6′ min. parkway strip between curb and sidewalk, no shrubs taller than 3′ and no tree limbs lower than 8′ at mature size
Rural Arterial	>110′	Refer to MCDOT Roadway Design Manual and ADOT Roadway Design Guidelines				

Source: HDR Engineering, Inc., September 2010



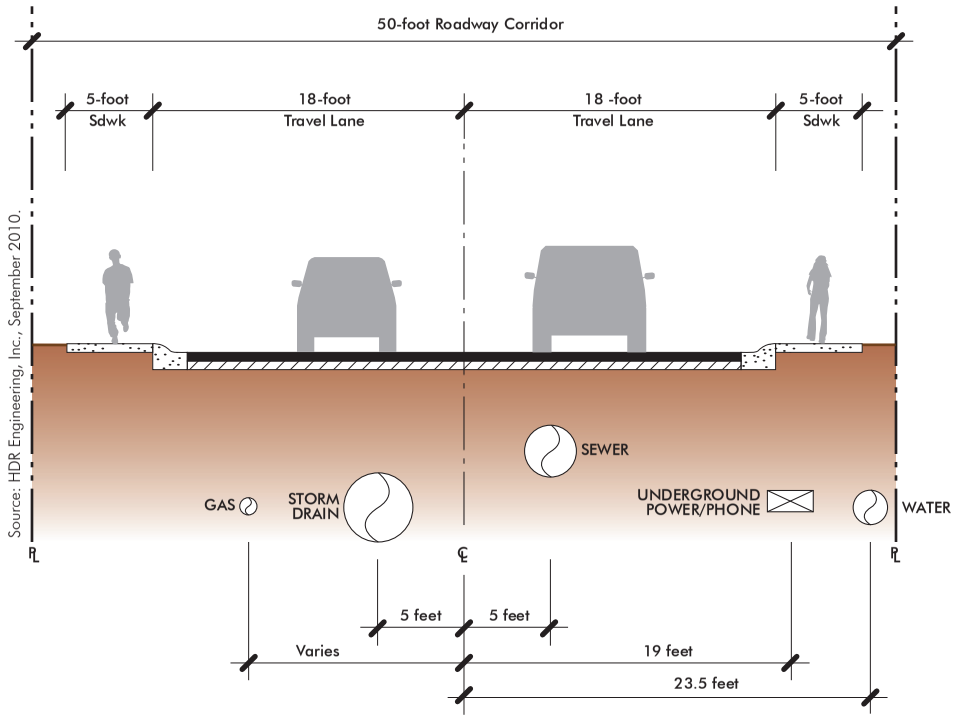
Note: For use with corridors having a lot frontage greater than 120 feet and serving less than 12 homes.
Section faces either north or west.
*If extended to have12 homes or more, add 5-foot sidewalk.

FIGURE 27 | Rural Access Way



Note: For use with corridors having a lot frontage greater than 60 feet and serving more than 12 homes.
Section faces either north or west.

FIGURE 28 | Rural Local Road



Note: For use with corridors having a lot frontage less than 60 feet.

FIGURE 29| Urban Local Residential

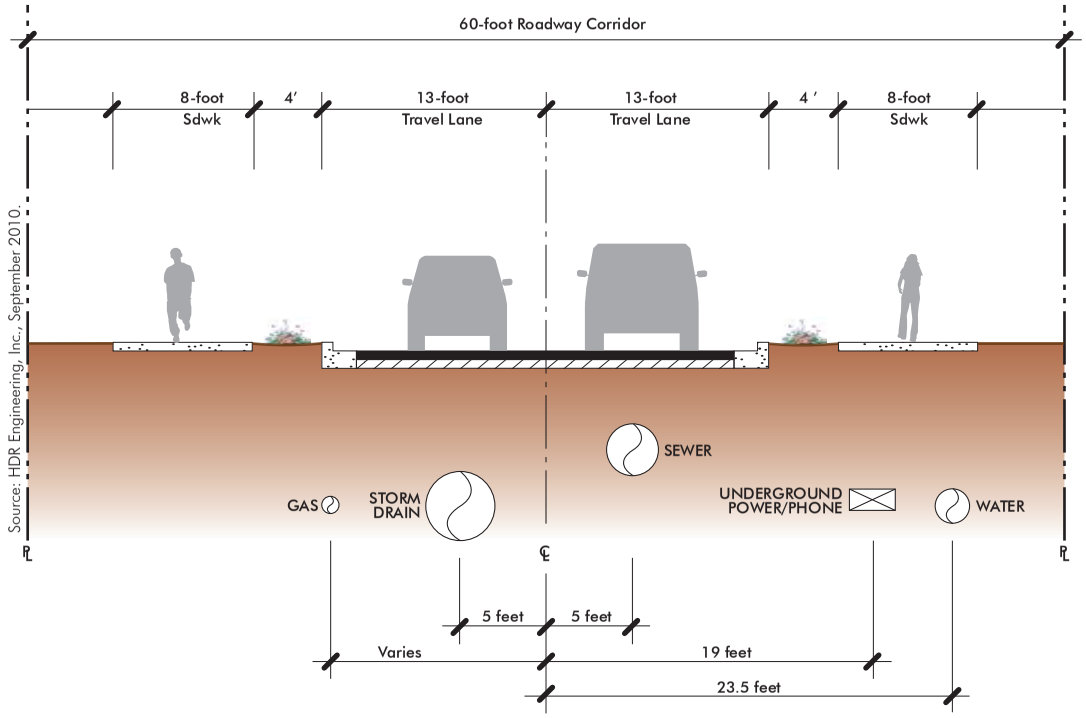
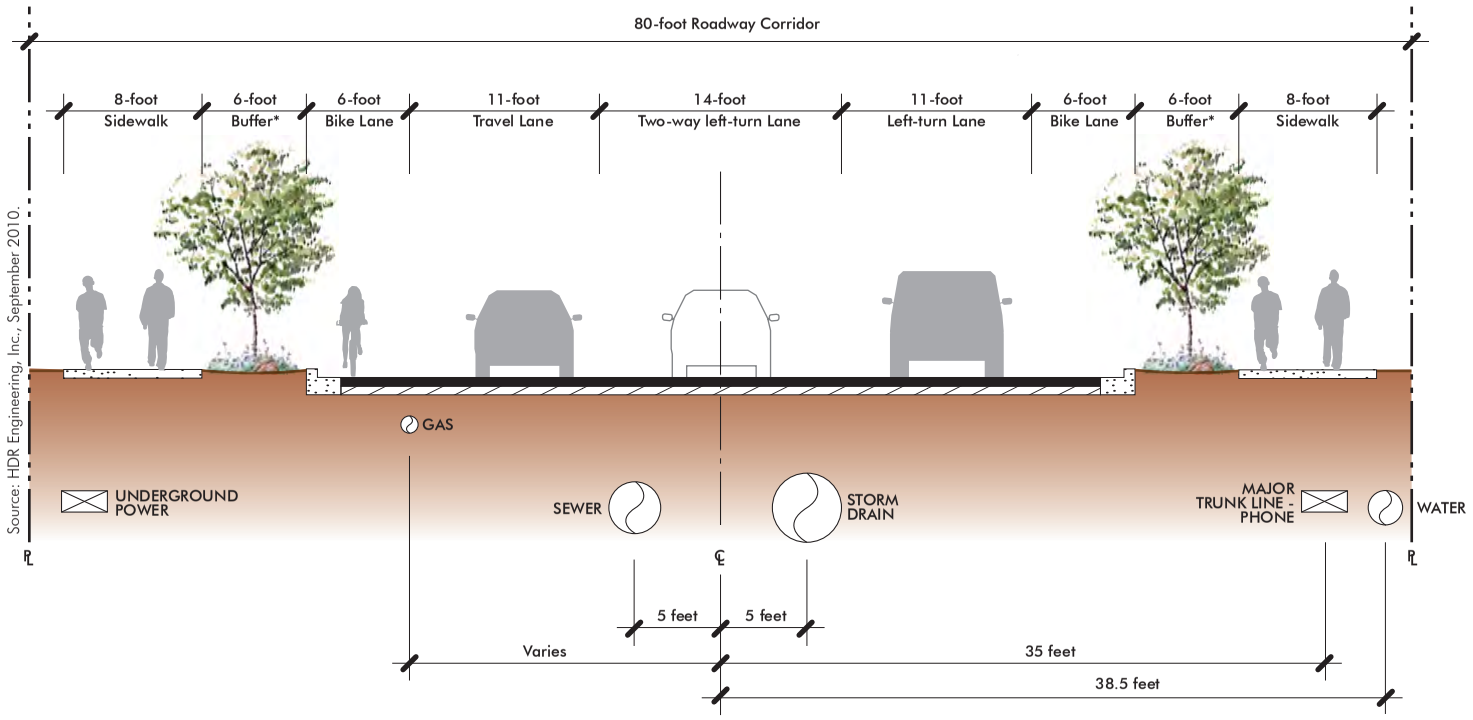
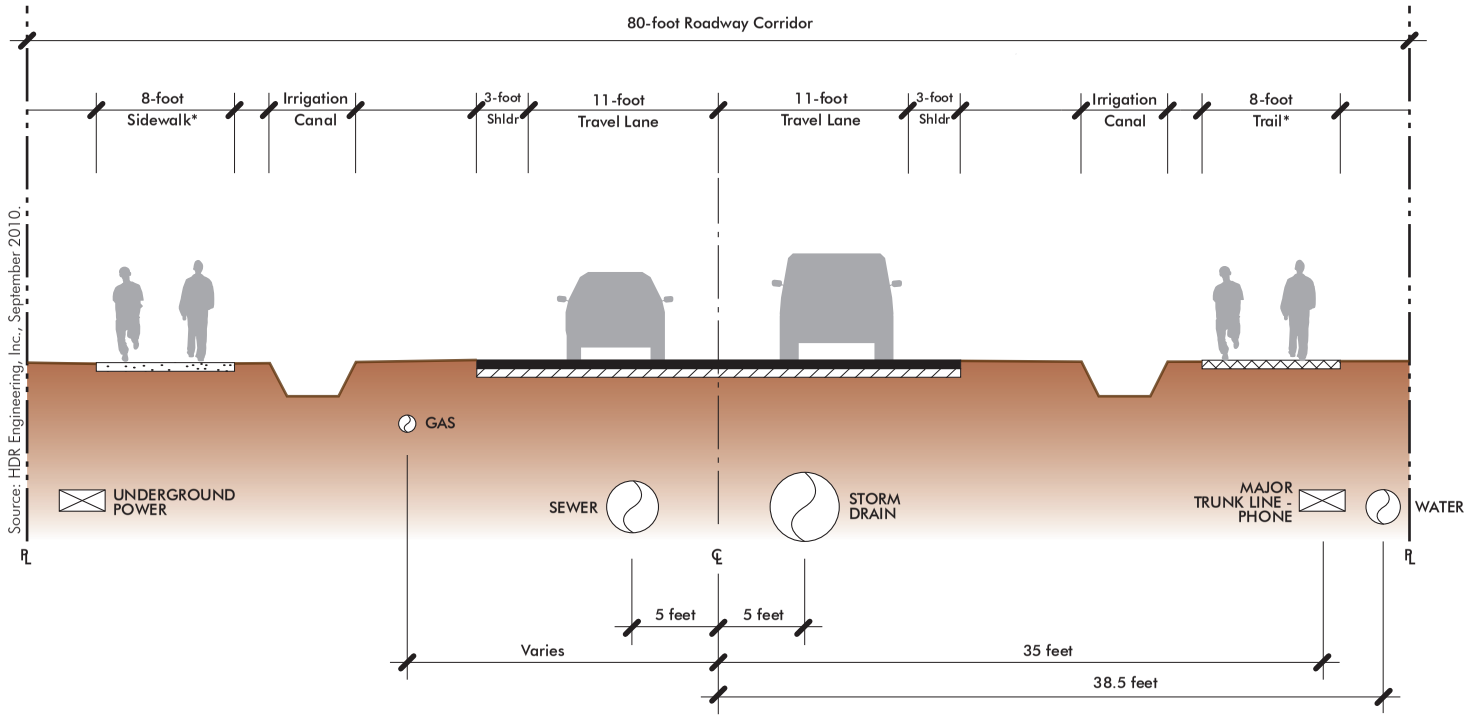


FIGURE 30 | Urban Local Commercial



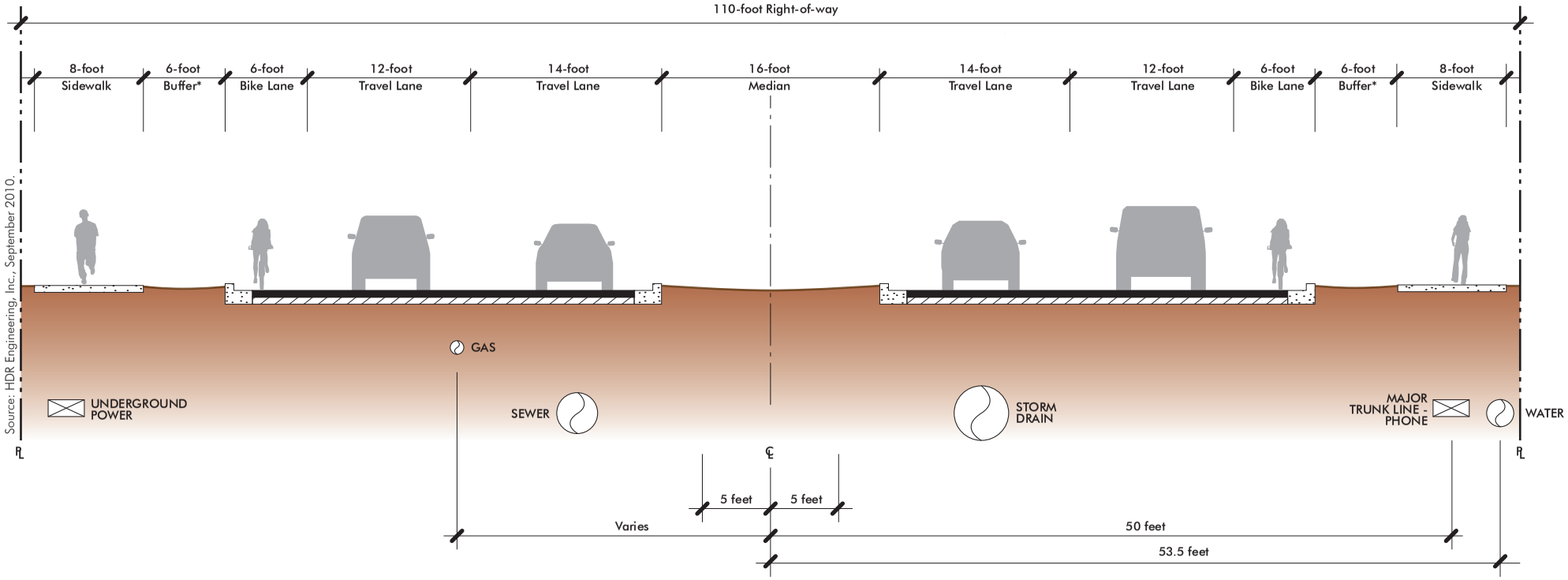
* No shrubs taller than 3 feet and no tree limbs lower than 8 feet at mature size.

FIGURE 31 | Urban Major Collector



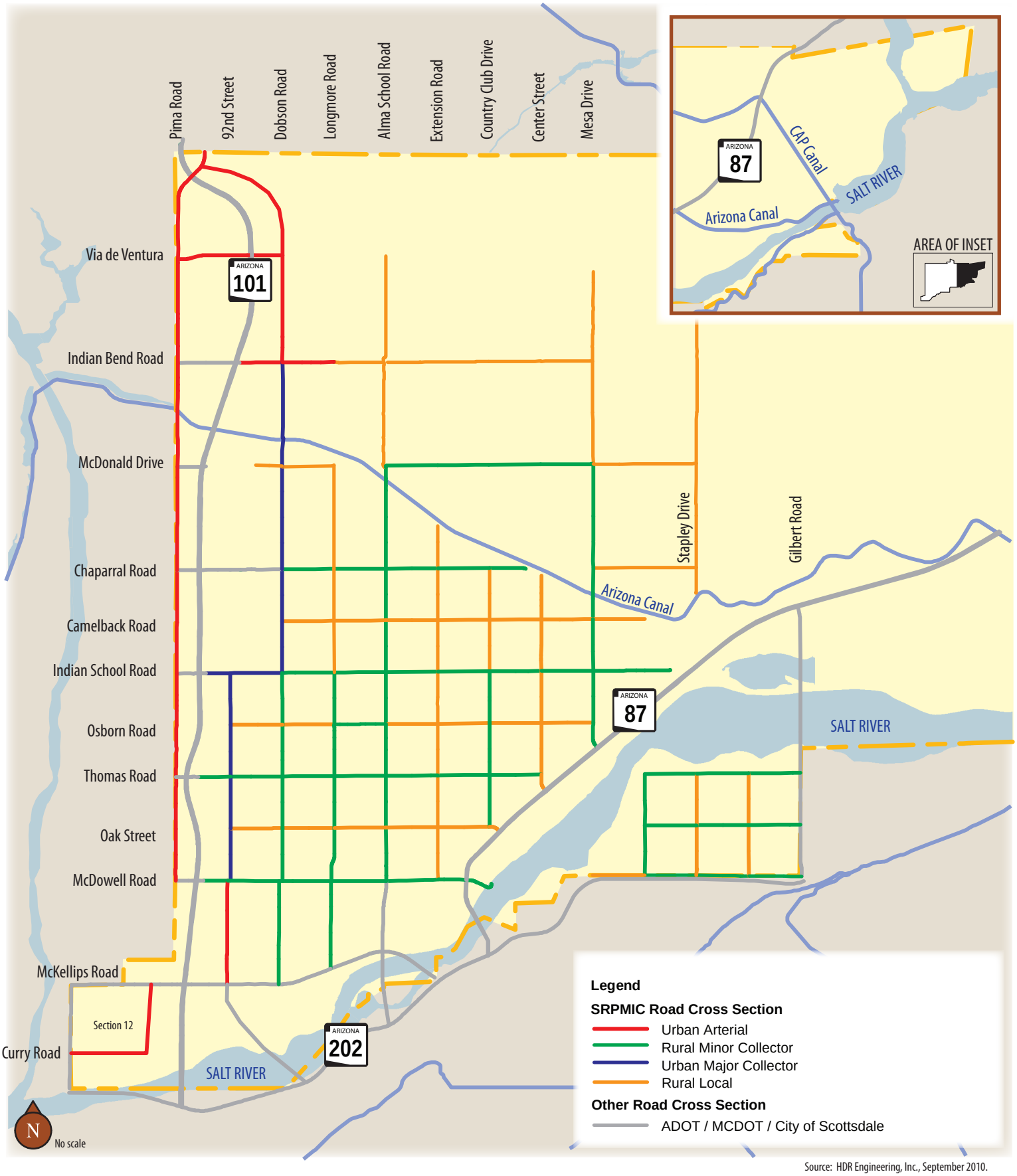
* Eight-foot trail/sidewalk will be for designated locations.

FIGURE 32 | Rural Minor Collector



NOTE: * No shrubs taller than 3 feet and no tree limbs lower than 8 feet at mature size.

FIGURE 33 | Urban Arterial



Source: HDR Engineering, Inc., September 2010.

FIGURE 34 | Recommended Road Cross Sections

6.3 Traffic Impact Analysis Guidelines

A Traffic Impact Analysis (TIA) is an important tool in the overall development planning process. The TIA provides information that identifies existing, near-term and long-term impacts of proposed developments on the road system. The study also identifies mitigation measures for the identified traffic impacts.

Requirements for Traffic Impact Analysis

A TIA will be required on all new developments within SRPMIC that generate 100 or more peak hour vehicle trips. Traffic impact studies for new developments affecting state highways must be conducted in accordance with ADOT traffic impact analysis study guidelines.

This process is meant to ensure that projects which are anticipated to create traffic impacts will be required to mitigate those impacts, while those smaller projects with lesser impacts are not unduly burdened with a requirement to perform a traffic study. If it is determined by the Community that a TIA is required, the applicant and SRPMIC must obtain agreement on the specific requirements. A meeting may be held prior to the initiation of the TIA on the following items:

- TIA guidelines will be discussed to ensure understanding by both the Community and TIA applicant. The Community has the final decision on the TIA requirements;
- Study area limits;
- Locations and type (AM, PM, and/or Midday, Daily) of traffic counts will be identified;
- Identifications of intersections to be evaluated;
- Study horizon years; and
- Any additional project specific requirements.

The applicant must also coordinate with ADOT, Maricopa County, and other surrounding jurisdictions as appropriate. The TIA will be prepared under the supervision of a registered Arizona Professional Engineer (Civil). The report will be sealed and signed.

Site Trip Generation

Traffic volumes generated by the proposed development will use the latest edition of the Institute of Transportation Engineers *Trip Generation*. Other rates may be used with prior approval by SRPMIC in cases where *Trip Generation* may not include specific land use category rates, have limited data, or where local rates may differ. Capacity analysis methodology will be based on the most current edition of the Transportation Research Board's *Highway Capacity Manual*.

Ambient Traffic

The City of Scottsdale Travel Demand Model should be used to develop ambient traffic forecasts for the traffic impact analysis. Select zone analysis can be used to isolate ambient trips generated within the model by the proposed site. To avoid double counting of site traffic, these ambient trips would be removed and replaced with the site trip generation estimated using ITE *Trip Generation* to enter into the SRPMIC SYNCHRO model.

SRPMIC SYNCHRO Model

Applicants should utilize the SRPMIC SYNCHRO traffic model for the preparation of their traffic impact study. Developed by Trafficware, SYNCHRO is a widely used transportation analysis software application for optimizing traffic signal timing and performing capacity analysis. The SRPMIC SYNCHRO model includes 34 signalized and unsignalized intersections in the Pima Freeway corridor. The applicant should

use these models to identify impacts to the SRPMIC road network. Any TIA submitted to SRPMIC should include SYNCHRO models for existing, no-build and build traffic conditions for staff review.

Traffic Analysis Outline

The following outline provides guidance for the topics that should be addressed when a traffic impact analysis is warranted.

1. Executive Summary
   a. Project Description
   b. Existing Conditions
   c. Probable Impacts of the Project (No-Build and Build Conditions)
   d. Traffic Operations Analysis (Existing, No-Build and Build Conditions)
   e. Mitigation Measures/Recommendations
   f. Conclusions
2. Introduction
   a. Project Description
   b. Site Location and Plan
   c. Study Area
   d. Site Accessibility
3. Existing Conditions
   a. Geometric and Traffic Control
   b. Traffic Volumes
   c. Level of Service
   d. Safety
4. No-Build Condition (Forecasted Traffic Without Proposed Development)
   a. Background Traffic Volumes
      i. Annual Growth
      ii. Site Specific Development (Other approved developments located within the designated study area scheduled for completion prior to proposed project)
   b. Planned Road Improvements
5. Build Condition (Forecasted With Proposed Project)
   a. Trip Generation
   b. Trip Distribution and Trip Assignment
   c. Phasing of Project
   d. Build Traffic Volumes
6. Traffic Operations Analysis
   a. Methodology
   b. Analysis Results
      i. No-Build Condition
      ii. Build Condition
7. Special Analyses/Issues
   a. Traffic Signal Warrants
   b. Others, as appropriate
8. Mitigation Measures/Recommendations
   a. Off Site Improvement Needs
   b. Proposed Site Access
   c. Traffic Safety
9. Conclusions
10. Appendix
    a. Traffic Count Data

b. Capacity Analysis Summary Sheets
c. Crash Data and Summaries

6.4 Access Management

Purpose

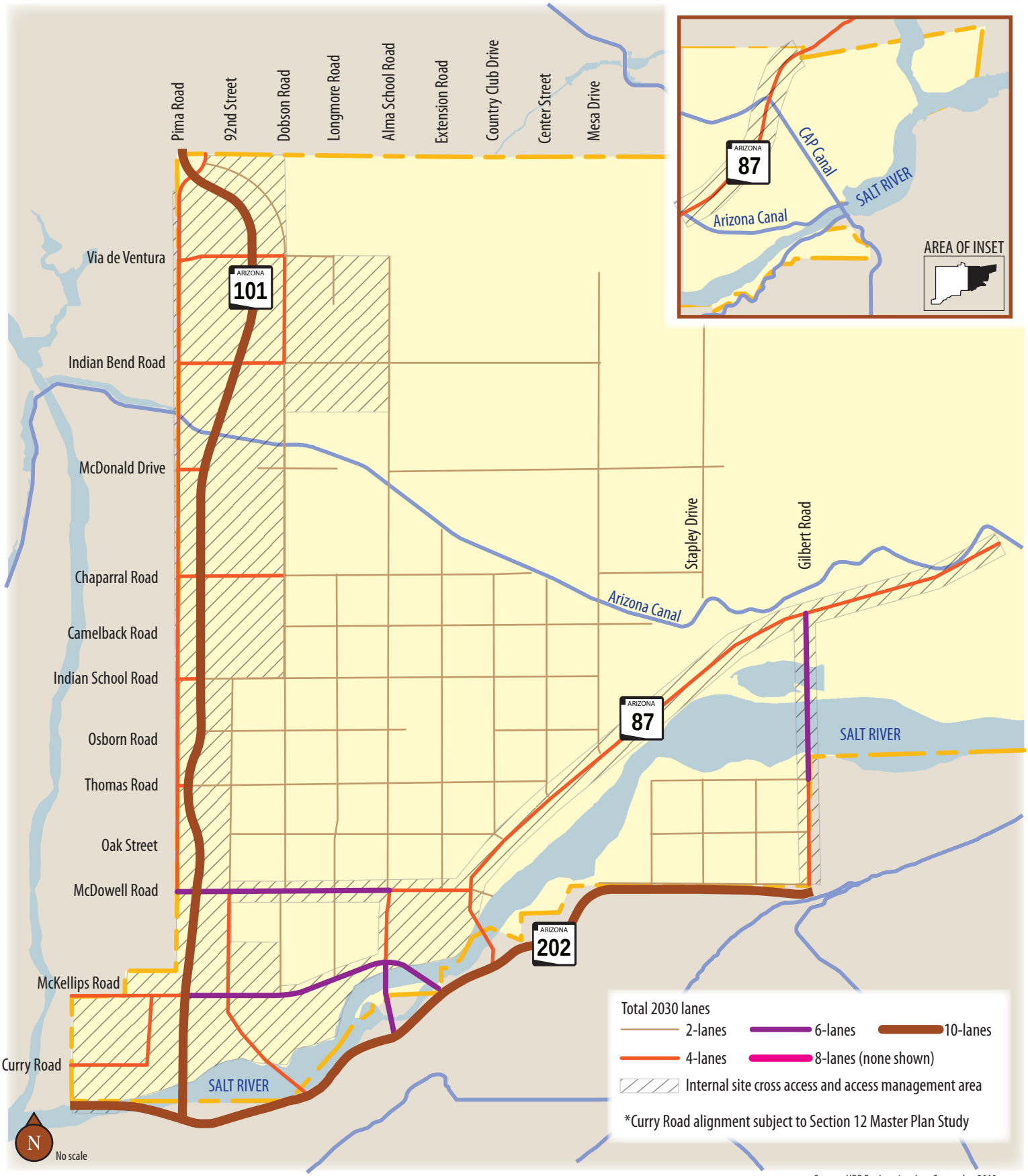
Access management is the systematic control, location, spacing, design, and operation of driveways and street connections, medians, median openings, turn lanes, traffic signals, and interchanges. The purpose is to provide (or improve upon the existing) access to land development while at the same time preserving the constant flow of traffic on surrounding roads, keeping crucial factors such as speed, safety and capacity needs in mind. ADOT defines access management as the control of the location and design of all vehicular approaches to the state highway system including driveways and public and private roads. This control includes the option to deny a direct highway connection when it is appropriate.

Historically, SRPMIC has relied on City of Scottsdale design standards for site planning and road design. The City's Design Standards & Policies Manual (DS&PM), 2009, provides guidelines for site planning and managing access to the external road system. It includes discussion of requirements for site access to the public street system that emphasize the importance of having an adequate internal vehicular circulation system. It recommends that sites integrate public transportation, bicycle, and pedestrian access. By using the same design standards as its urban neighbor, SRPMIC has generated a continuity of access for the growing commercial centers in the Pima Freeway corridor. For new access on either an ADOT or MCDOT road, the responsible agency's access management guidelines are employed. SRPMIC engages with the developers and agencies in the review process.

For SRPMIC, implementing robust access management policies of its own should be an important part of the Community's strategy for reducing cut-through commuter traffic. Access management for peripheral roads should go hand-in-glove with the interior traffic calming measures. Protecting high capacity corridors like McKellips Road, McDowell Road, Pima Road, 92nd Street and Dobson Road will maintain higher travel speeds, reducing the likelihood that a shortcut through the Community will be faster for commuters. Figure 35 identifies areas in SRPMIC's Pima Freeway commercial corridor for active access management.

Key Category Access Factors

- Intersection spacing
- Allowing direct access or require to obtain alternative access
- Proof of access necessity
- Scope of access improvement, such as requiring auxiliary lanes, (deceleration and acceleration lanes)
- Defining the levels of allowable access and spacing for different kinds of roads. Providing a mechanism for granting variances in cases where reasonable access to adjacent roads cannot be provided
- The challenge of access management is making the effort towards creating and maintaining a balance between land development plans and the functional integrity of the roads that serve these developments and the region.



Source: HDR Engineering, Inc., September 2010.

FIGURE 35 | Access Management Areas

Legal Issues of Access Control

Private property rights, including access rights, are guaranteed by Fifth Amendment of the Constitution and subject to reasonable regulation through the local government for public health, safety, and welfare. The right of access is one of reasonable access, rather than private or direct access. However, once a direct access has been provided to a non-controlled access highway then the property owner has an access easement. Any taking of private property, including access rights, for legitimate public purpose by the Community would require compensation, unless waived by property owners.

The SRPMIC has the authority to regulate traffic on its roads including restricting driveway location, spacing, size and design, restricting traffic movement to one direction. In general, property owners have the right of reasonable access to an adjacent road but sometimes this may be restricted in order to enhance public safety or where it is of public interest to do so. Private rights of abutting landowners to access their property tend to be subservient to those of the public (i.e. their rights to free and safe use of the public street-system of travel).

Community roads are administered by different authorities or entities, including the BIA, tribe, city, county and state. It is important to understand the relationship between land use and the functionality of the road that passes through it.

Subdivision Regulations

SRPMIC has authority to regulate subdivisions. Subdivisions can be regulated with regard to the following access management techniques:

- Control the number of access points in relation to road deceleration and acceleration lanes to avoid conflict points;
- Ensure design of adequate driveway throat length to avoid a conflict with the flow of off-site traffic;
- Provide adequate driveway spacing requirements, corner clearance, and joint and cross access configurations;
- Orient lots, buildings, and access points to local streets and not to high-traffic-volume arterials; and
- Require reverse frontage to ensure that lots abutting the road obtain access from a local road.

A Community site plan review process can require documentation of all access points and the internal circulation system. Intersection controls, medians and on-site circulation controls can be required to ensure that access and design standards for roads are followed, and that lots are configured in a manner that encourages adequate spacing between access points.

On state highways, what constitutes "legal" access is a determination by ADOT. Since ADOT has adopted access standards, engineering requirements and a regulatory permitting program, legal access to a state highway may only be determined by ADOT under the authority of the Director, not by county, city or Community officials. Absent an ADOT determination of legal sufficiency, the property deed should note that the property does not have legal access established.

Zoning Ordinance

To promote effective access management, SRPMIC zoning ordinances can: require larger minimum lot frontages; adopt minimum spacing standards for driveways; encourage joint and cross access; require complete on-site circulation; and promote activity centers rather than strip development.

General Plan

The next update of the SRPMIC General Plan should identify access issues and problems; establish goals, objectives and policies regarding access; identify access management approaches; and designate key transportation corridors for special treatment.

Methods of Controlling Access

Access management, as an important means for maintaining mobility, encompasses a set of techniques that are available for use to control access to highways, major arterials and other roads. These include the following:

- Access Spacing: increasing the distance between intersections/access points can reduce congestion and improve traffic flow, it can also improve air quality on heavily traveled roads. Subdivision and homesite regulations can ensure correct and safe spacing between access points.
- Driveway spacing: fewer driveways that are spaced further apart can allow for more orderly merging of traffic and presents fewer challenges for drivers.
- Safe Turning Lanes: dedicated left- and right-turn, indirect left-turns and U-turns, and roundabouts keep through-traffic flowing. Roundabouts represent an opportunity to improve an intersection with many conflict points or a severe crash history (e.g., T-bone crashes) to one that operates with fewer conflict points and less severe crashes (e.g., sideswipes) if they occur.
- Median Treatments: two-way left turns and non-traversable raised medians are two of the most effective ways to regulate access and reduce crashes
- Right-of-Way Management: this pertains to right-of-way reservation for future widening, good sight distance, access location, and other access-related issues.

Access Planning and Design

Access planning and design should aim to coordinate the three components of the access system: the public road, the private road, and the activity center or land development itself. The elements that must be taken into account surrounding these components are: 1) limiting the number of conflict points, 2) separating conflict areas (e.g., through use of traffic signals), 3) reducing acceleration and deceleration impacts at access points, 4) removing vehicles from through traffic lanes, 5) spacing major intersections to facilitate progressive travel speeds along arteries, and 6) providing adequate on-site storage.

Permitting Considerations

- Allow some variation from spacing standards at an administrative level
  - Distinguish between major and minor deviations from spacing standards
  - Require more vigorous review of major deviations
- Establish permit conditions
  - Type and volume of traffic
  - Interim access until alternative access is obtained
- Address when existing access must be brought into confirmatory
  - Substantial enlargements or improvements
  - Significant change in trip generation
  - Beyond any specific permit term or condition
  - If use is discontinued

- Need to be clearly defined

Additional Resources

ADOT is currently developing a Statewide Access Management Plan in accordance with the policies of the State Transportation Board. This plan develops an access management classification system for the State Highways and also a manual to guide the uniform application of access management throughout the state. Current general guidance for access management criteria may be found in *Roadway Design Guidelines and Traffic Engineering Policies, Guidelines and Procedures*.

Appendix A

Indian Reservation Road System Inventory

Appendix B

Public Involvement Summary Reports

- SPRMIC Technical Advisory Committee and Consultant Team
- SRPMIC Stakeholders
- Lehi Elder Breakfast Outreach Meeting Notes (9/2/09)
- Special Interest Groups Outreach Efforts
    - Councilwoman Claire Miller District Meeting Notes (9/22/09)
    - Young River People's Council Notes (9/23/09)
    - Councilman Tom Largo District Meeting Notes (9/28/09)
    - Salt River Safety Day Notes (10/8/09)
    - SRPMIC Earth Day Outreach Notes (4/24/10)
- SRPMIC Community Workshops (10/19/09 and 10/22/09)
- Stakeholder Interview Summary Report (11/20/09)
- SRPMIC Tribal Council Outreach Notes (05/12/10)
- Second Round of Public Outreach Summary Report
    - Elders' Breakfast (4/17/10 and 5/5/10)
    - SRPMIC Earth Day Celebration (4/24/10)
    - Community Workshops (5/15/10 and 5/24/10)
    - Tribal Council Presentations (5/12/10 and 6/16/10)

Appendix C

Functional Classification

- Bureau of Indian Affairs Functional Classification Description
- 2009 FHWA Phoenix-Mesa East Functional Classification

Appendix D

Summary of Generalized Annual Average Daily Volumes for the Phoenix Urban Area

Appendix E

2009 Study Intersection Level of Service

- Lane Configuration
- Peak Hour Traffic and Level of Service Estimates

Appendix F

Planning, Impact Fees, and Fiscal Analysis Study Data

Appendix G

2030 Study Intersection Level of Service

- Lane Configuration
- Peak Hour Traffic and Level of Service Estimates

Appendix H

Trails Plan Segment Information